SONY

DATA PROJECTOR

VPL-ES7
VPL-EX7
VPL-EX70

REMOTE COMMANDER
RM-PJ6

SERVICE MANUAL
1st Edition

⚠警告

このマニュアルは，サービス専用です。
お客様が，このマニュアルに記載された設置や保守，点検，修理などを行うと感電や火災，人身事故につながることがあります。
危険をさけるため，サービストレーニングを受けた技術者のみご使用ください。

⚠ WARNING

This manual is intended for qualified service personnel only.
To reduce the risk of electric shock, fire or injury, do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so. Refer all servicing to qualified service personnel.

⚠ WARNUNG

Die Anleitung ist nur für qualifiziertes Fachpersonal bestimmt.
Alle Wartungsarbeiten dürfen nur von qualifiziertem Fachpersonal ausgeführt werden. Um die Gefahr eines elektrischen Schlages, Feuergefahr und Verletzungen zu vermeiden, sind bei Wartungsarbeiten strikt die Angaben in der Anleitung zu befolgen. Andere als die angegeben Wartungsarbeiten dürfen nur von Personen ausgeführt werden, die eine spezielle Befähigung dazu besitzen.

⚠ AVERTISSEMENT

Ce manual est destiné uniquement aux personnes compétentes en charge de l’entretien. Afin de réduire les risques de décharge électrique, d’incendie ou de blessure n’effectuer que les réparations indiquées dans le mode d’emploi à moins d’être qualifié pour en effectuer d’autres. Pour toute réparation faire appel à une personne compétente uniquement.

注意

指定以外の電池に交換すると，破裂する危険があります。
必ず指定の電池に交換してください。
使用済みの電池は，国または地域の法令に従って処理してください。

CAUTION

Danger of explosion if battery is incorrectly replaced.
Replace only with the same or equivalent type recommended by the manufacturer.
When you dispose of the battery, you must obey the law in the relative area or country.

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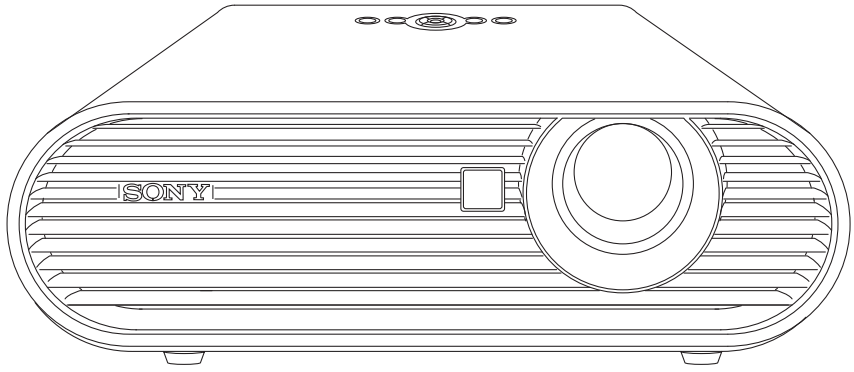
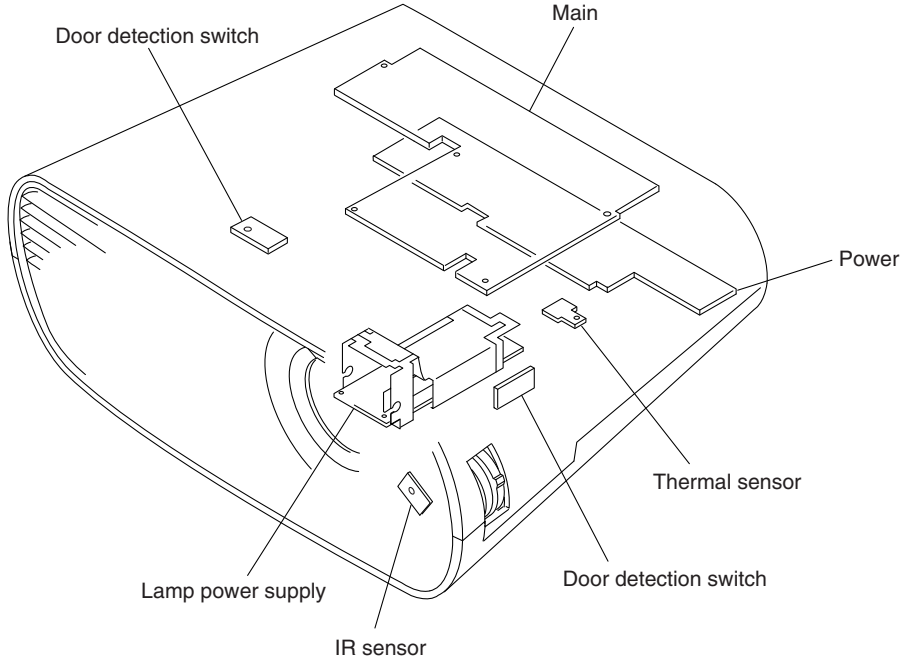
Section 1
Service Overview

1-1. Appearance Figure

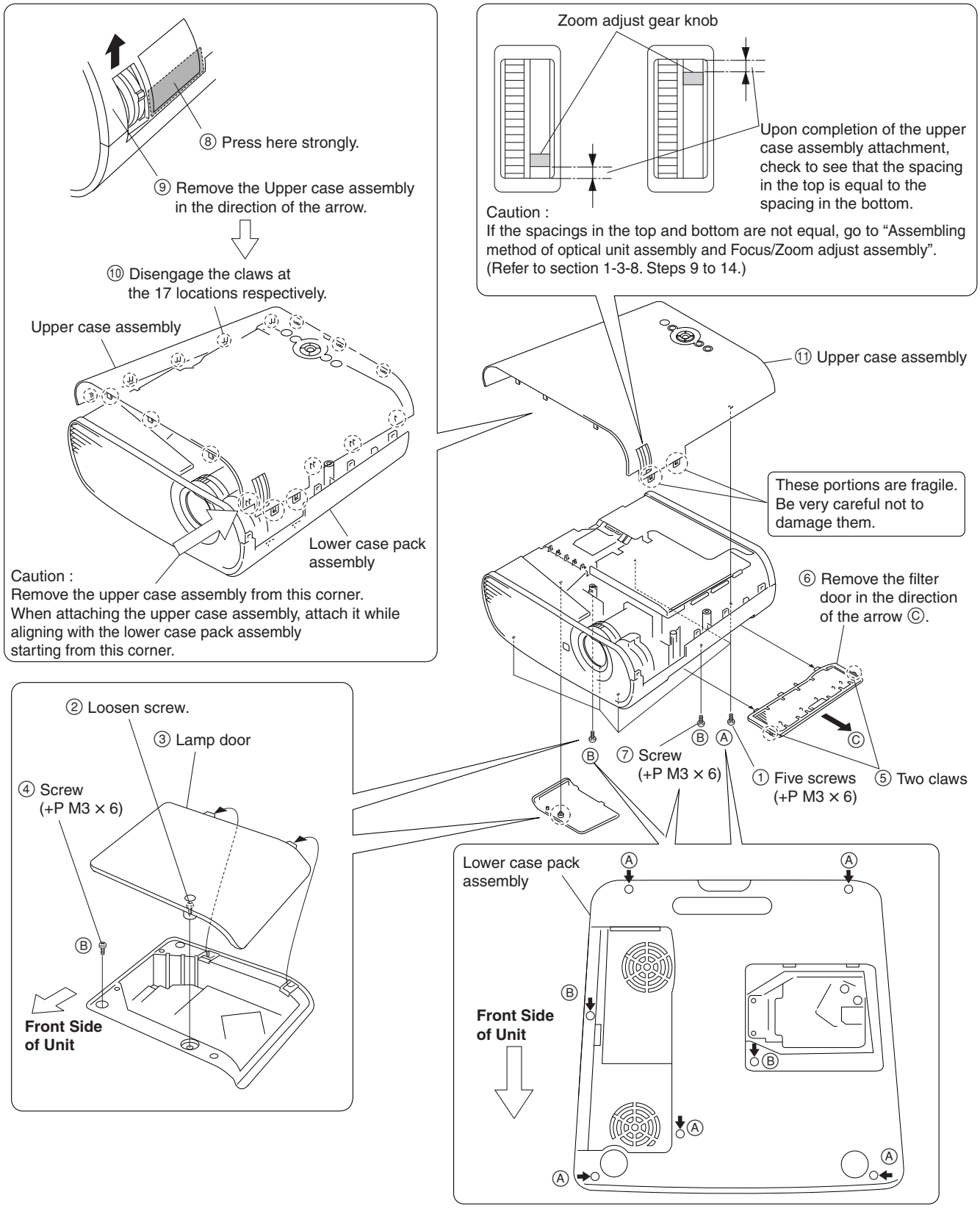


1-2. Board Locations

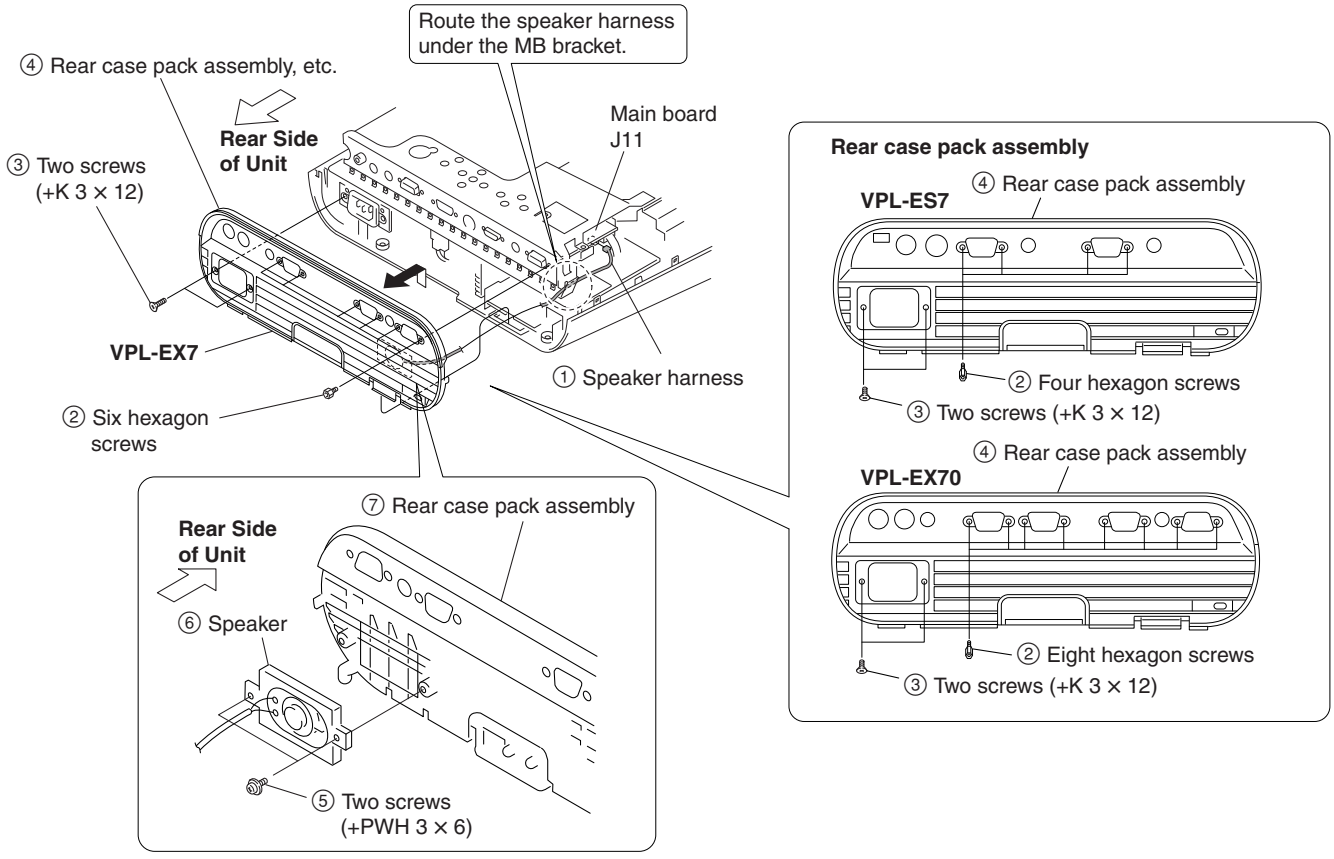


1-3. Disassembly

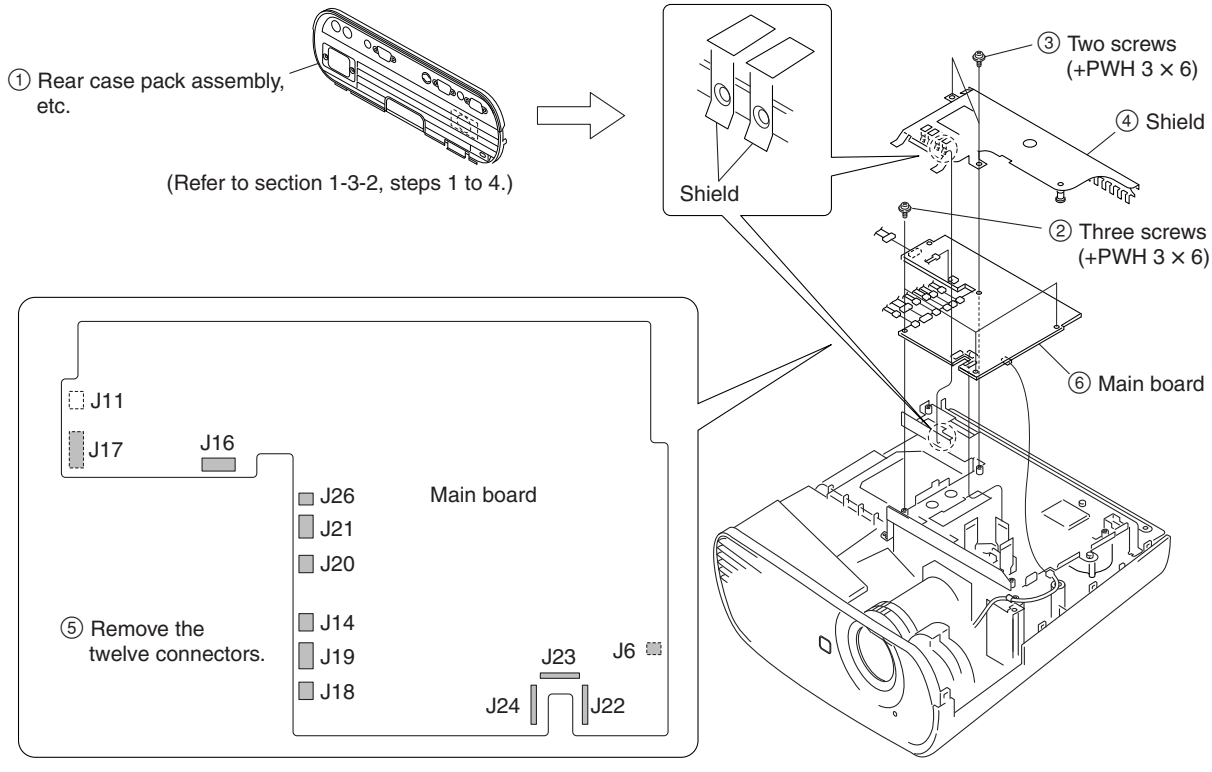
1-3-1. Upper Case Assembly


⑧ Press here strongly.
⑨ Remove the Upper case assembly in the direction of the arrow.
⑩ Disengage the claws at the 17 locations respectively.
Upper case assembly
Lower case pack assembly
Caution :
Remove the upper case assembly from this corner.
When attaching the upper case assembly, attach it while aligning with the lower case pack assembly starting from this corner.
Zoom adjust gear knob
Upon completion of the upper case assembly attachment, check to see that the spacing in the top is equal to the spacing in the bottom.
Caution :
If the spacings in the top and bottom are not equal, go to “Assembling method of optical unit assembly and Focus/Zoom adjust assembly”. (Refer to section 1-3-8. Steps 9 to 14.)
⑪ Upper case assembly
These portions are fragile. Be very careful not to damage them.
⑥ Remove the filter door in the direction of the arrow Ⓒ.
② Loosen screw.
③ Lamp door
④ Screw (+P M3 × 6)
Ⓑ
Front Side of Unit
Ⓑ
⑦ Screw (+P M3 × 6)
Ⓑ Ⓐ
① Five screws (+P M3 × 6)
⑤ Two claws
Ⓒ
Lower case pack assembly
Ⓐ Ⓐ
Ⓑ
Front Side of Unit
Ⓑ
Ⓐ
Ⓐ Ⓐ

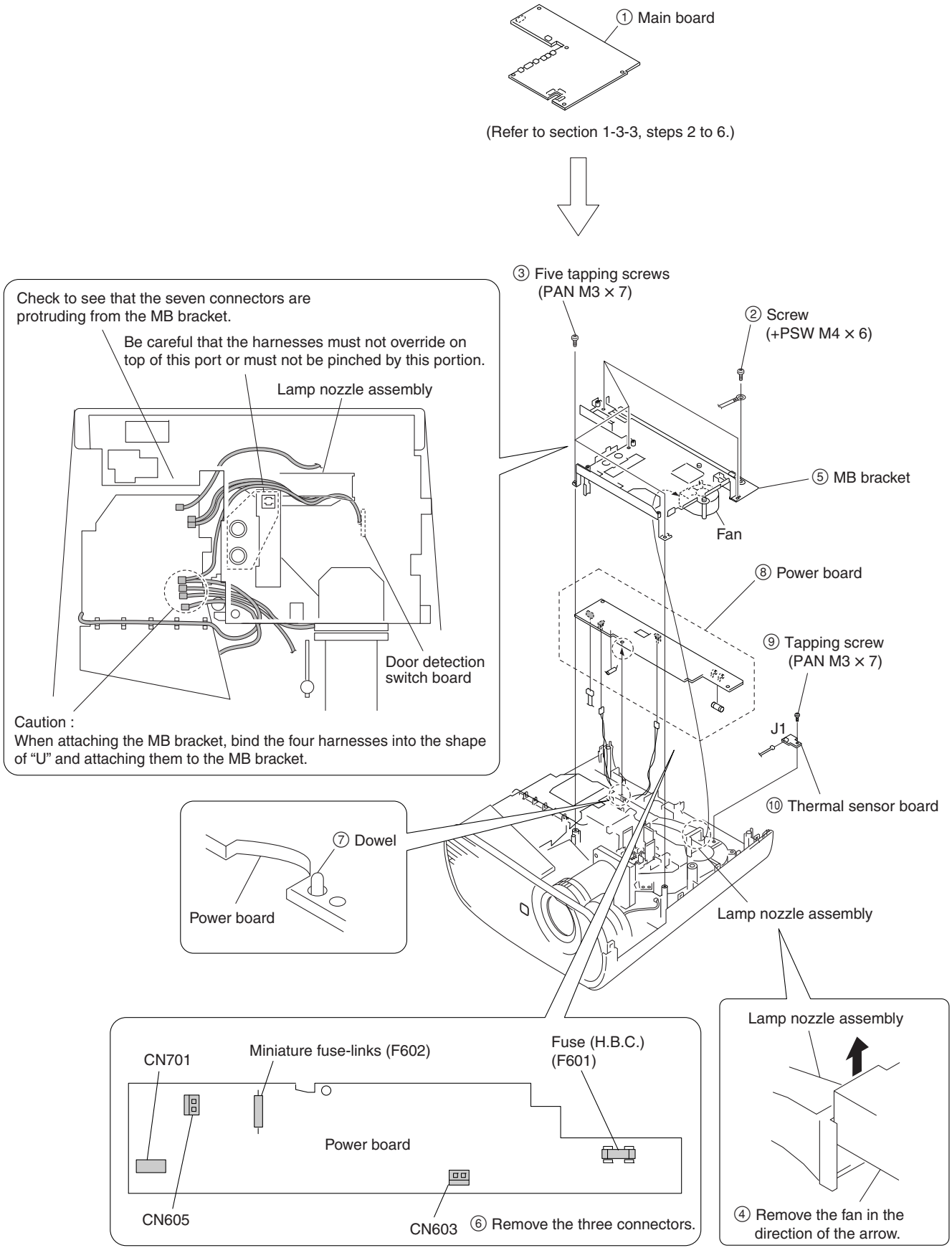
1-3-2. Rear Case Pack Assembly


Route the speaker harness under the MB bracket.
④ Rear case pack assembly, etc.
Rear Side of Unit
Main board J11
③ Two screws (+K 3 × 12)
VPL-EX7
① Speaker harness
② Six hexagon screws
⑦ Rear case pack assembly
Rear Side of Unit
⑥ Speaker
⑤ Two screws (+PWH 3 × 6)
Rear case pack assembly
VPL-ES7
④ Rear case pack assembly
② Four hexagon screws
③ Two screws (+K 3 × 12)
VPL-EX70
④ Rear case pack assembly
② Eight hexagon screws
③ Two screws (+K 3 × 12)

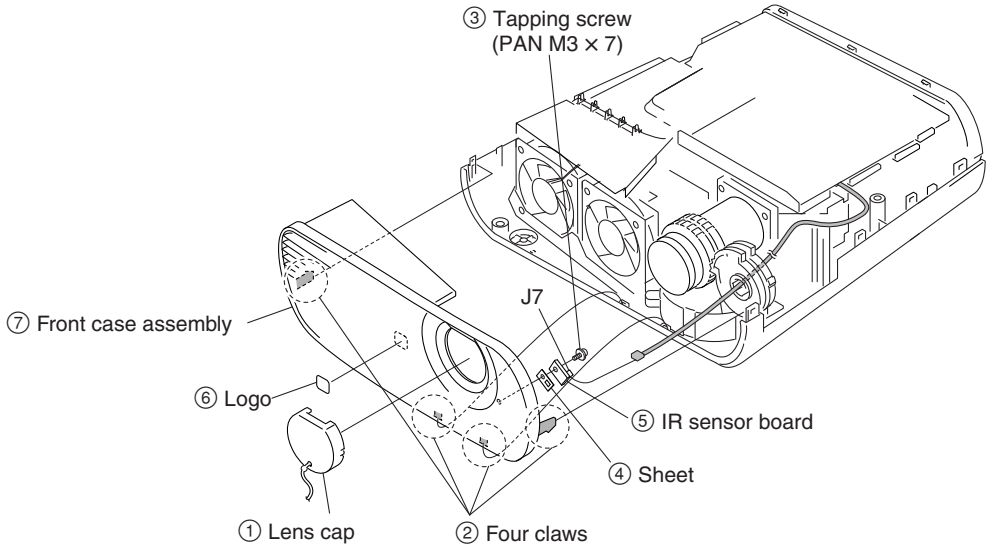
1-3-3. Main Board



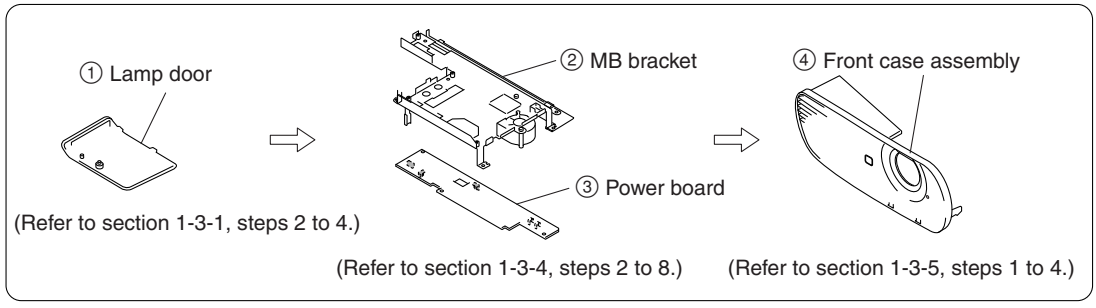
1-3-4. Power Board and Thermal Sensor Board

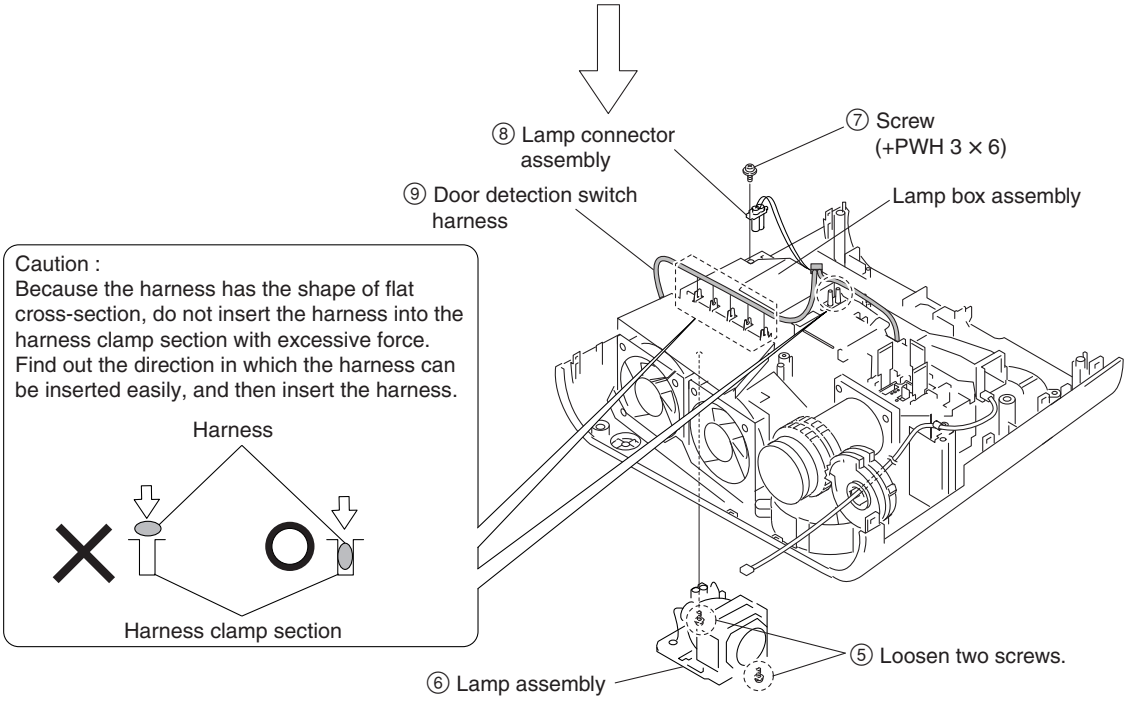

① Main board
(Refer to section 1-3-3, steps 2 to 6.)
③ Five tapping screws (PAN M3 × 7)
② Screw (+PSW M4 × 6)
⑤ MB bracket
Fan
⑧ Power board
⑨ Tapping screw (PAN M3 × 7)
J1
⑩ Thermal sensor board
Lamp nozzle assembly
Check to see that the seven connectors are protruding from the MB bracket.
Be careful that the harnesses must not override on top of this port or must not be pinched by this portion.
Lamp nozzle assembly
Door detection switch board
Caution :
When attaching the MB bracket, bind the four harnesses into the shape of “U” and attaching them to the MB bracket.
⑦ Dowel
Power board
CN701
Miniature fuse-links (F602)
Fuse (H.B.C.) (F601)
Power board
CN605
CN603
⑥ Remove the three connectors.
Lamp nozzle assembly
④ Remove the fan in the direction of the arrow.

1-3-5. Front Case Assembly and IR Sensor Board

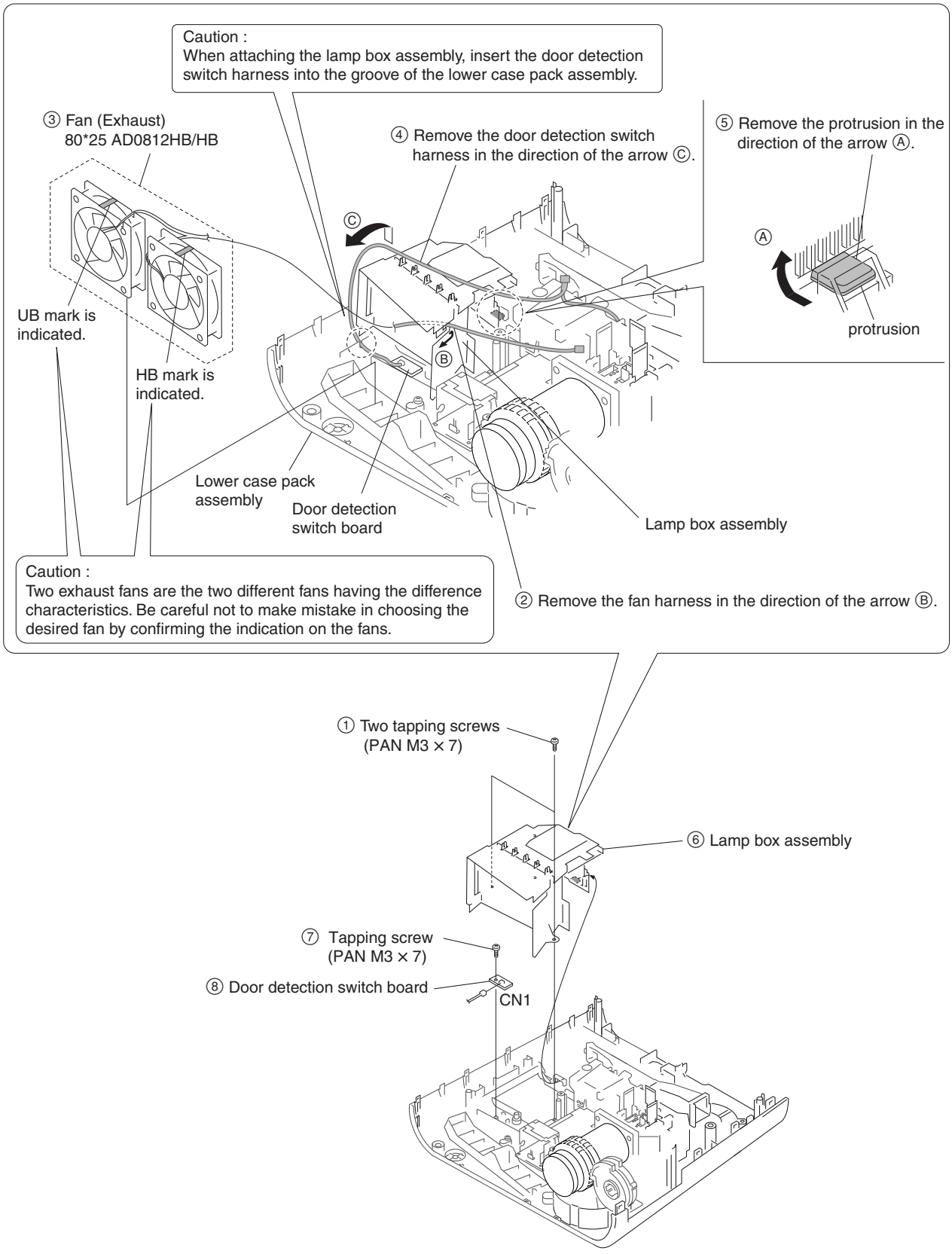


1-3-6. Fan (Exhaust) -1

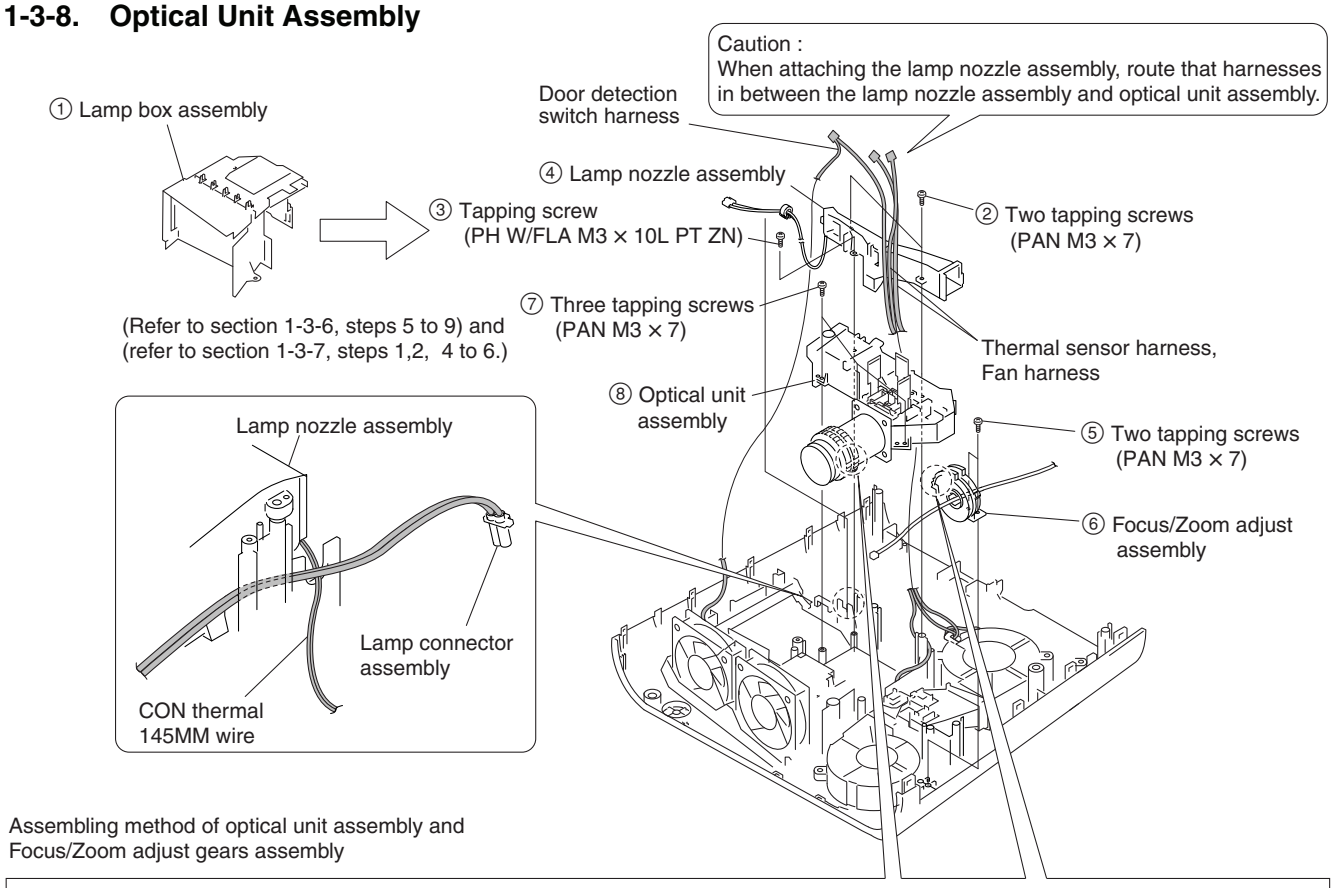

① Lamp door
② MB bracket
④ Front case assembly
③ Power board
(Refer to section 1-3-1, steps 2 to 4.)
(Refer to section 1-3-4, steps 2 to 8.)
(Refer to section 1-3-5, steps 1 to 4.)


⑧ Lamp connector assembly
⑦ Screw
(+PWH 3 × 6)
⑨ Door detection switch harness
Lamp box assembly
Caution :
Because the harness has the shape of flat cross-section, do not insert the harness into the harness clamp section with excessive force. Find out the direction in which the harness can be inserted easily, and then insert the harness.
Harness
Harness clamp section
⑤ Loosen two screws.
⑥ Lamp assembly

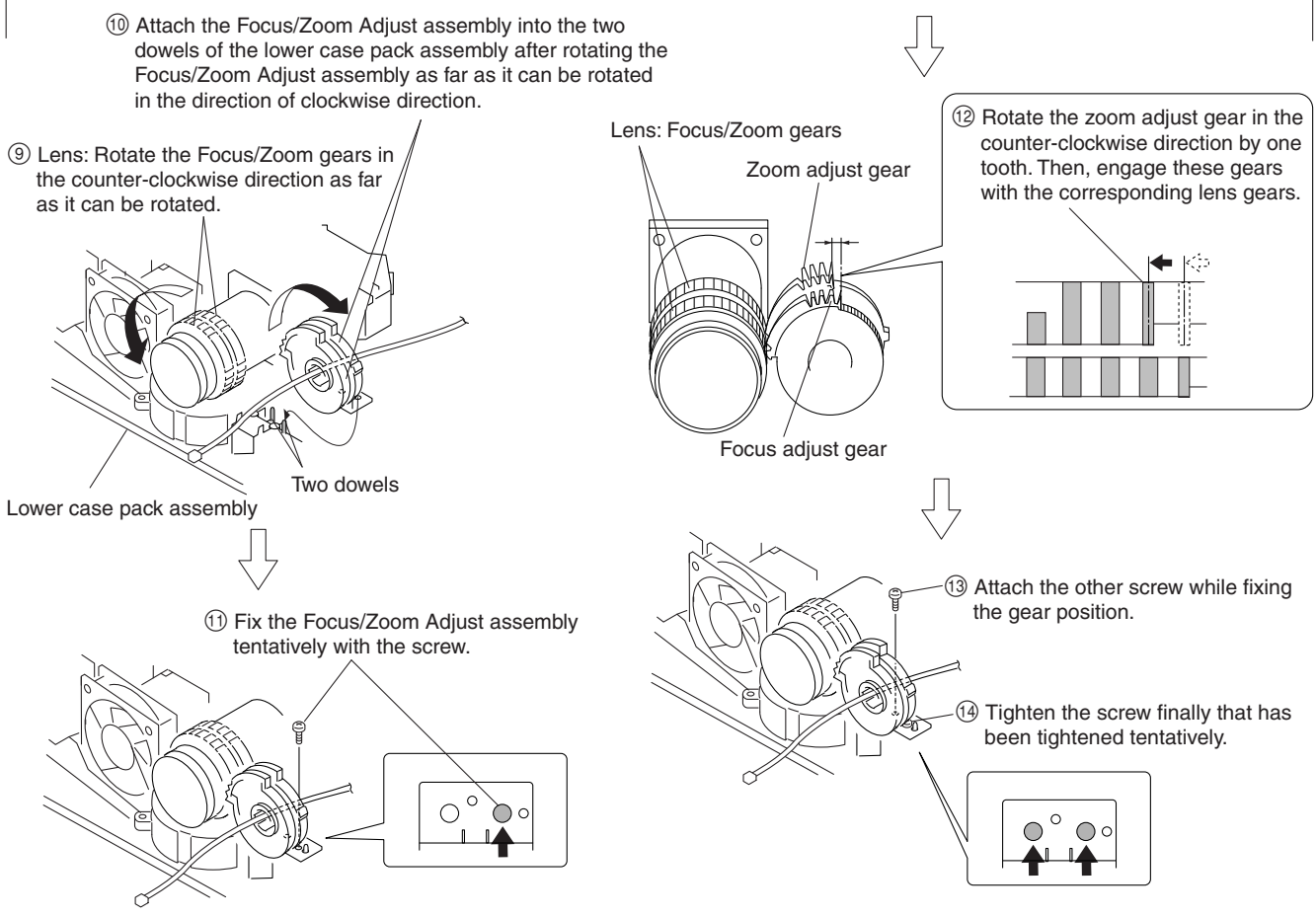
1-3-7. Fan (Exhaust) -2


Caution :
When attaching the lamp box assembly, insert the door detection switch harness into the groove of the lower case pack assembly.
③ Fan (Exhaust)
80*25 AD0812HB/HB
④ Remove the door detection switch harness in the direction of the arrow Ⓒ.
⑤ Remove the protrusion in the direction of the arrow Ⓐ.
Ⓒ
Ⓐ
protrusion
UB mark is indicated.
HB mark is indicated.
Ⓑ
Lower case pack assembly
Door detection switch board
Lamp box assembly
Caution :
Two exhaust fans are the two different fans having the difference characteristics. Be careful not to make mistake in choosing the desired fan by confirming the indication on the fans.
② Remove the fan harness in the direction of the arrow Ⓑ.
① Two tapping screws (PAN M3 × 7)
⑥ Lamp box assembly
⑦ Tapping screw (PAN M3 × 7)
⑧ Door detection switch board
CN1

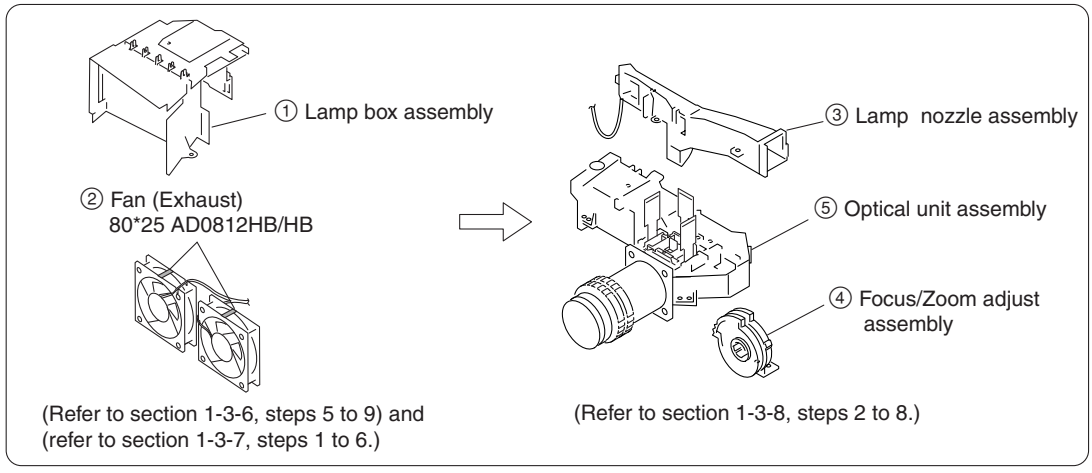
1-3-8. Optical Unit Assembly

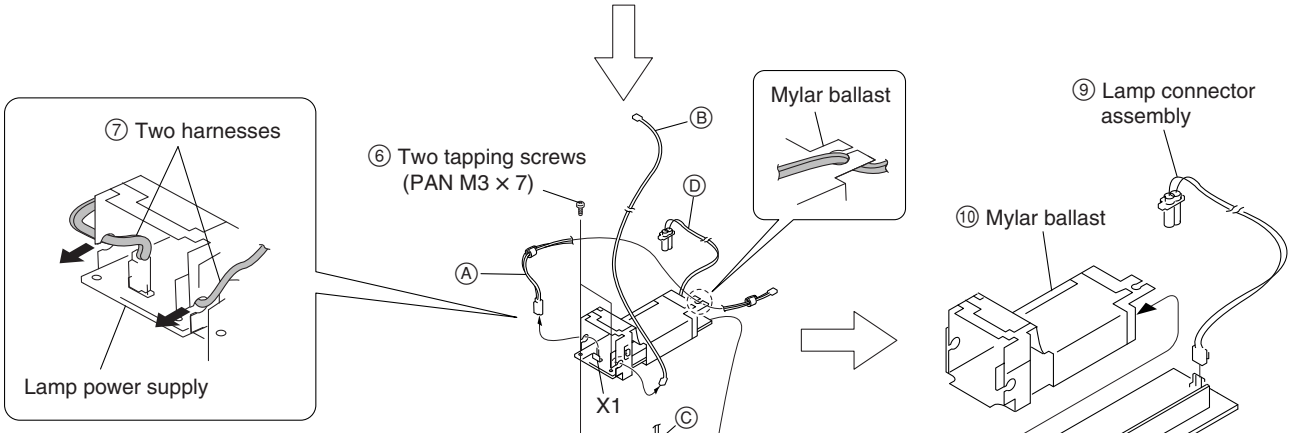

Caution :
When attaching the lamp nozzle assembly, route that harnesses in between the lamp nozzle assembly and optical unit assembly.
① Lamp box assembly
(Refer to section 1-3-6, steps 5 to 9) and
(refer to section 1-3-7, steps 1,2, 4 to 6.)
Door detection switch harness
④ Lamp nozzle assembly
③ Tapping screw (PH W/FLA M3 × 10L PT ZN)
② Two tapping screws (PAN M3 × 7)
⑦ Three tapping screws (PAN M3 × 7)
Thermal sensor harness, Fan harness
⑧ Optical unit assembly
⑤ Two tapping screws (PAN M3 × 7)
⑥ Focus/Zoom adjust assembly
Lamp nozzle assembly
Lamp connector assembly
CON thermal 145MM wire

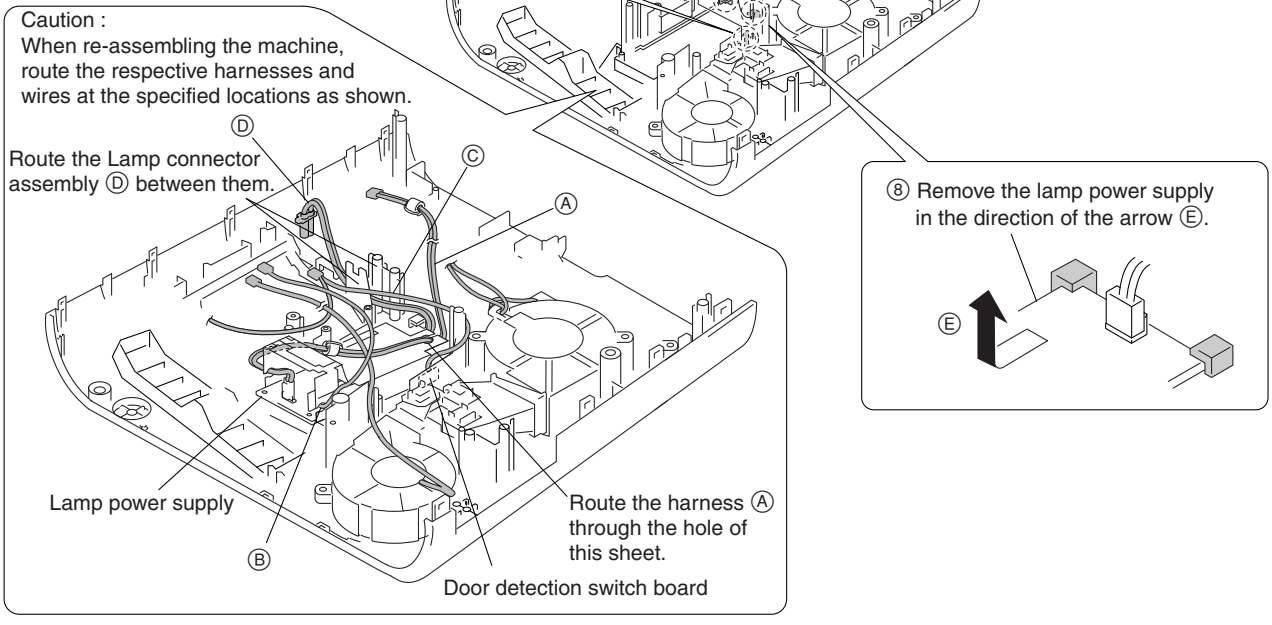
Assembling method of optical unit assembly and Focus/Zoom adjust gears assembly


⑩ Attach the Focus/Zoom Adjust assembly into the two dowels of the lower case pack assembly after rotating the Focus/Zoom Adjust assembly as far as it can be rotated in the direction of clockwise direction.
⑨ Lens: Rotate the Focus/Zoom gears in the counter-clockwise direction as far as it can be rotated.
Two dowels
Lower case pack assembly
Lens: Focus/Zoom gears
Zoom adjust gear
Focus adjust gear
⑫ Rotate the zoom adjust gear in the counter-clockwise direction by one tooth. Then, engage these gears with the corresponding lens gears.
⑪ Fix the Focus/Zoom Adjust assembly tentatively with the screw.
⑬ Attach the other screw while fixing the gear position.
⑭ Tighten the screw finally that has been tightened tentatively.

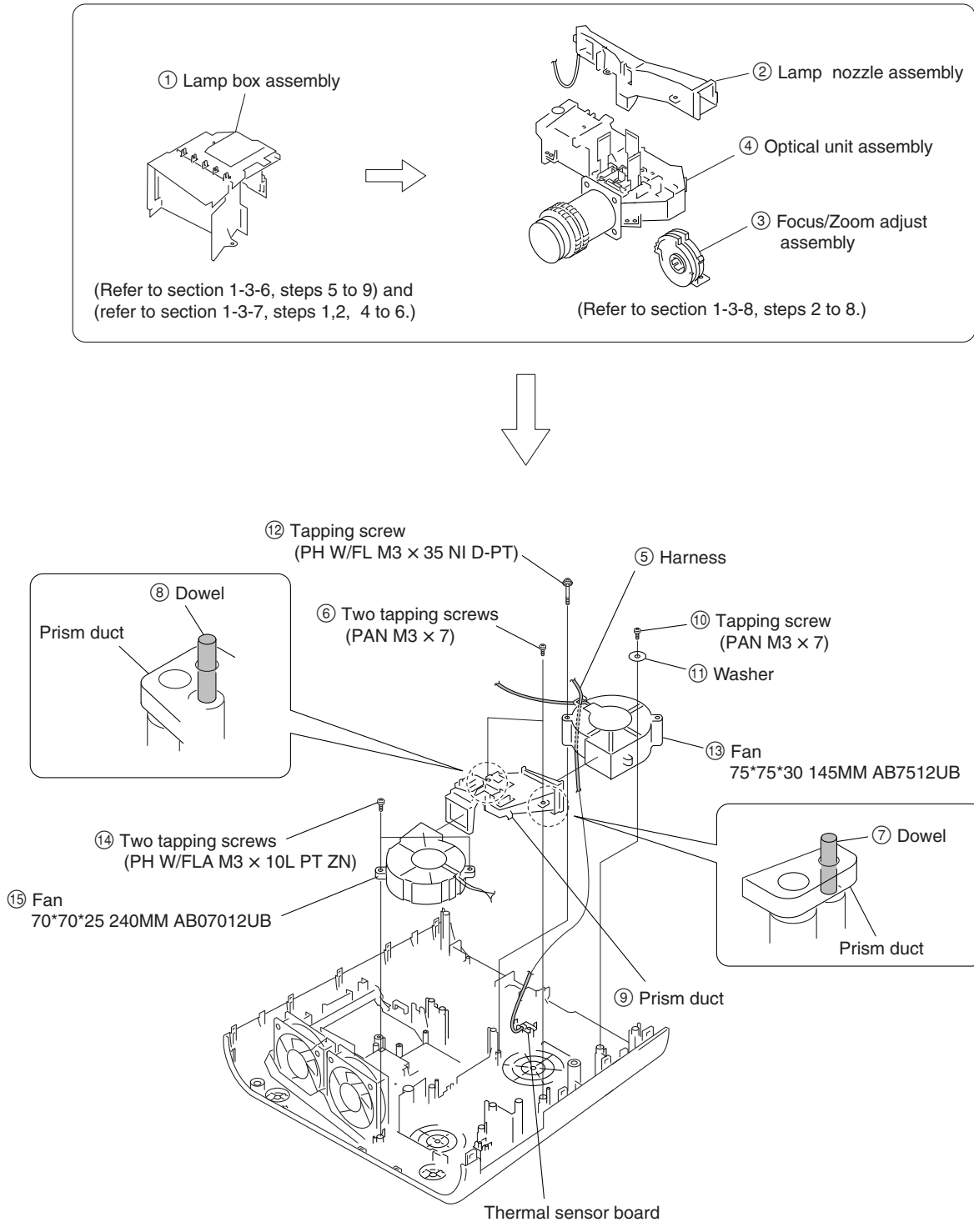
1-3-9. Lamp Power Supply


① Lamp box assembly
② Fan (Exhaust)
80*25 AD0812HB/HB
③ Lamp nozzle assembly
⑤ Optical unit assembly
④ Focus/Zoom adjust assembly
(Refer to section 1-3-6, steps 5 to 9) and
(refer to section 1-3-7, steps 1 to 6.)
(Refer to section 1-3-8, steps 2 to 8.)




Caution :
When re-assembling the machine, route the respective harnesses and wires at the specified locations as shown.
Route the Lamp connector assembly Ⓓ between them.
Ⓓ
Ⓒ
Ⓐ
Ⓑ
Lamp power supply
Route the harness Ⓐ through the hole of this sheet.
Door detection switch board
⑧ Remove the lamp power supply in the direction of the arrow Ⓔ.
Ⓔ

1-3-10. Fan


① Lamp box assembly
② Lamp nozzle assembly
④ Optical unit assembly
③ Focus/Zoom adjust assembly
(Refer to section 1-3-6, steps 5 to 9) and
(refer to section 1-3-7, steps 1,2, 4 to 6.)
(Refer to section 1-3-8, steps 2 to 8.)
⑫ Tapping screw
(PH W/FL M3 × 35 NI D-PT)
⑤ Harness
⑧ Dowel
Prism duct
⑥ Two tapping screws
(PAN M3 × 7)
⑩ Tapping screw
(PAN M3 × 7)
⑪ Washer
⑬ Fan
75*75*30 145MM AB7512UB
⑭ Two tapping screws
(PH W/FLA M3 × 10L PT ZN)
⑮ Fan
70*70*25 240MM AB07012UB
⑦ Dowel
Prism duct
⑨ Prism duct
Thermal sensor board

1-3-11. 3D GAMMA Service tool Application Software

Feature :

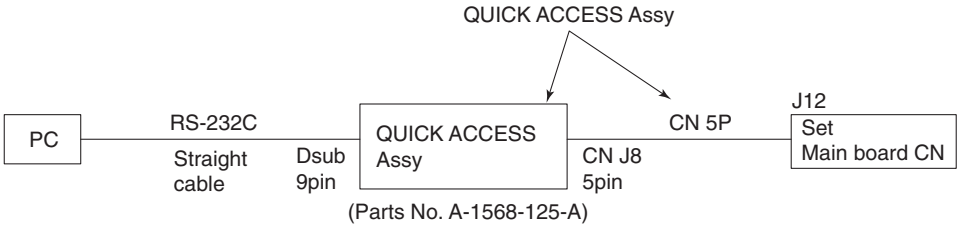
The Ernie Service Tool is the application software for performing the tasks such as SAVE and LOAD of the 3D GAMMA data on the projector that is connected to a PC via a communication function. The Ernie Service Tool has the following features.

- It can read 3D gamma data from a set and save it in a file.
- It can write 3D gamma data in a PC into a set.

When the optical unit is replaced, load 3D gamma data recorded on the CD-ROM, which is supplied together with the optical unit, into a set using the application software.

For details of the Ernie Service Tool, refer to the Technical Memo.

- VPL-ES7 set has not RS-232C terminal, use the QUICK ACCESS Assy.
- Remove the rubber cap on the upper left of the rear side of the unit.



1-4. Indicator

The error status of the this units are indicated by the type of flashing of indicator. The top cover has the ON/STANDBY indicator and the LAMP/COVER indicator. Various error contents are indicated by the type of flashing of indicator. For details of the types of indicator flashing and the error statuses, refer to the list shown below.

ON/STANDBY Indicator (Red flashing)

Error Name	Flash Frequency	Status
Temperature Error	2 Times	The temperature of the equipment is high.
Fan Error	4 Times	Each fan does not work normally.
Power Error	6 Times	The power is not turned on correctly.

LAMP/COVER Indicator (Orange flashing)

Error Name	Flash Frequency	Status
Cover Error	2 Times	The lamp or filter cover is opened.
Lamp Error	3 Times	The UHP lamp is not lighting.

Section 2
Electrical Adjustments

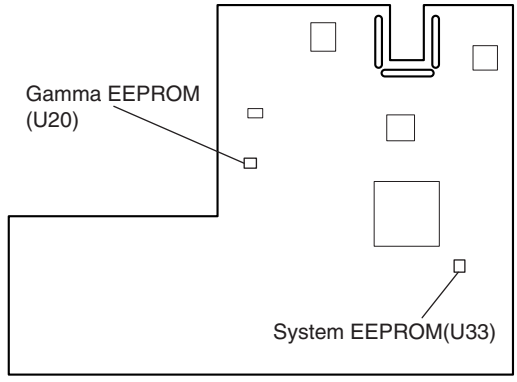
2-1. How to Enter the Service Mode

1. Power on the projector.
2. Push the switches on the remote controller or controller panel as below.
   Enter → Enter → ← → Enter key
3. Service mode menu will appear on the screen.

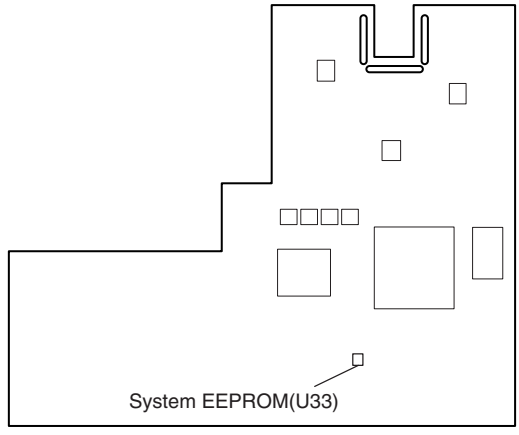
2-2. Adjustment of Main Board When it is Replaced

2-2-1. Save the Optical Data and Replacement

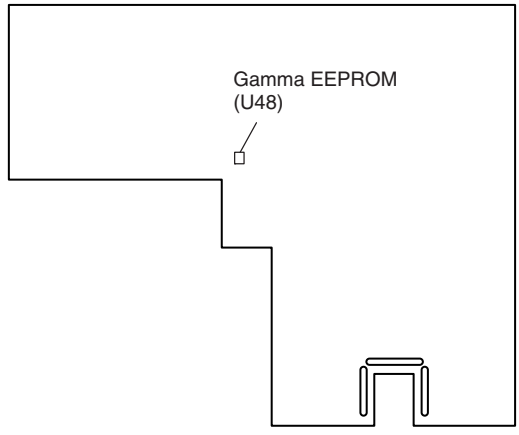
1. Try to read the optical data from the faulty unit using the Emie Service tool. If succeeded in reading, replacement of the EEPROM is not necessary but the V COM Adjustment should be performed. (Refer to "2-5 V COM Adjustment".)
2. If the optical data could not be read from the faulty unit in step 1, remove the IC (EEPROM) from the faulty board and replace the IC (EEPROM) of the new board with the removed one.
   Reference number: U33, U48(ES7), U20(EX7/EX70)
3. Run the RGB and YUV calibration.



EX70/EX7 Main Board



ES7 Main Board



2-3. EEPROM Replacement

EEPROM of the main board contains the following alignment data

System EEPROM (32 kbits) (U33)

- V com setting
- Color temperature
- RGB gain and offset for PC
- YUV gain and offset for YPbPr
- OSD setting

Gamma EEPROM (256 kbits) (U48: ES7, U20: EX7/EX70)

- 3D gamma
- Panel gamma

2-4. ADC Calibration

2-4-1. RGB Alignment Procedure

1. Power on the projector.
2. Input the following signal from the signal generator to the INPUT A connector.
   Timing: VPL-EX7/EX70 : 1024 × 768@60Hz
   VPL-ES7 : 800 × 600@60Hz
   Pattern: 16 gray pattern
   If the pattern shown in Fig. 1 is not available, the pattern shown in Fig. 3 can be used for the adjustment. Use the signal shown in Fig. 2 to run APA. Then, input the signal shown in Fig. 3.
3. Enter the service mode and change to page “ADC Calibration”.
4. Press [→] key to run calibration.
5. When calibration is executed, the screen brightness changes for approx. 5 seconds. After that, the screen brightness, the RGB Offset data and the RGB Gain data become stabilized.

Fig.1

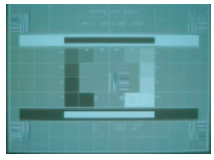
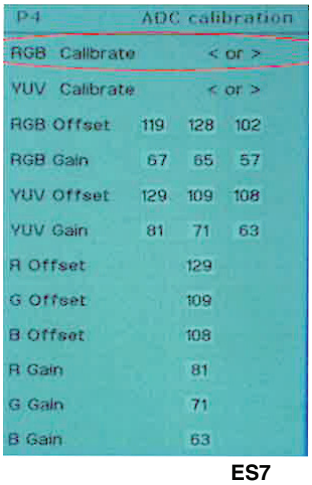
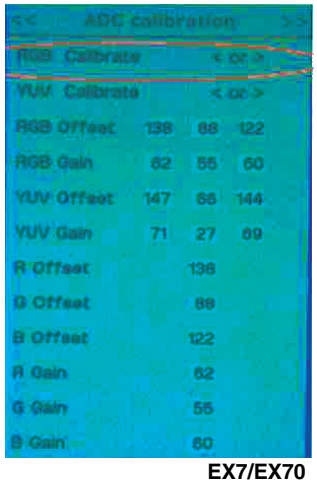


Fig.2

Fig.3



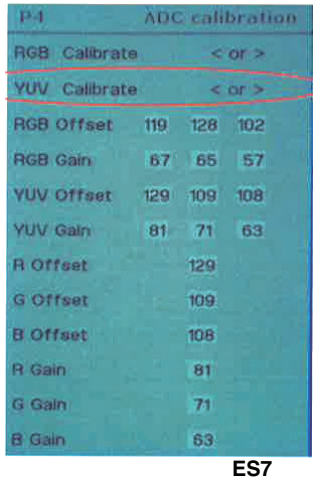
ES7



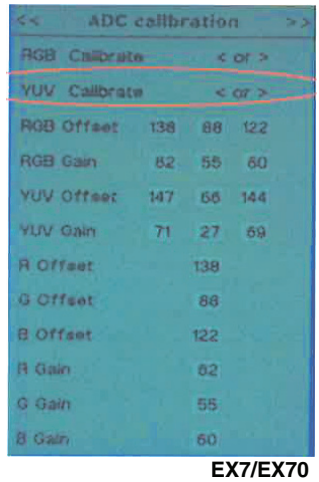
EX7/EX70

2-4-2. YUV Alignment Procedure

1. Power on the projector.
2. Input the following signal from the signal generator to the INPUT A connector.
   Timing: 480P
   Pattern: SMPTE color bar
3. Enter the service mode and change to page “ADC Calibration”.
4. Press [→] key to run calibration.
5. When calibration is executed, the screen brightness changes for approx. 5 seconds. After that, the screen brightness, the YUV Offset data and the YUV Gain data become stabilized.



ES7



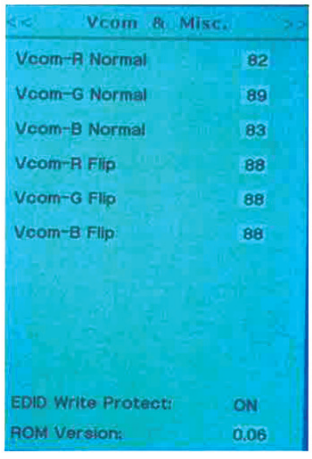
EX7/EX70

2-5. V COM Adjustment

- By the Ernie Service tool, the V COM data is not replaced. Therefore, perform the V COM Adjustment when optical data is replaced by the Ernie Service tool.
- When the EEPROM is replaced, the V COM data is inherited so that the V COM adjustment is not necessary. If flicker is significant on the screen, perform the V COM adjustment.

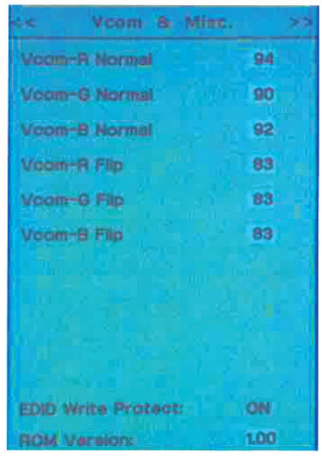
Procedure: VPL-ES7

1. Input the 100 % flat-field signal to the INPUT A connector and allow the warm-up of 10 minutes aging at a minimum.
2. Enter the service mode and change to page 4 “Vcom & Misc” page.
3. Input the XGA, R-single color, 30 %, single-line ON/OFF signal.
4. Move the cursor key until it is positioned at Vcom-R Normal.
5. Adjust the V com-R Normal value until flicker is reduced to minimal by →, ← key.
6. Change the input signal to the XGA, G-single color, 30 %, single-line ON/OFF signal.
7. Move the cursor key until it is positioned at Vcom-G Normal.
8. Adjust the V com-G Normal value until flicker is reduced to minimal by →, ← key.
9. Change the input signal to the XGA, B-single color, 30 %, single-line ON/OFF signal.
10. Move the cursor key until it is positioned at Vcom-B Normal.
11. Adjust the V com-B Normal value until flicker is reduced to minimal by →, ← key.
12. Reverse the “Image Flip” upside-down and right-to-left, and repeat the above adjustment procedure from step 2 to step 11.



Procedure: VPL-EX7/EX70

1. Input the 100 % flat field signal to the INPUT A connector and allow the warm-up of 10 minutes aging at a minimum.
2. Enter the service mode and change to page 4 to select “Vcom & Misc”.
3. Input the XGA, G-single color, 80 %, flat-field signal.
4. Move the cursor key until it is positioned at Vcom-G Normal.
5. Adjust the V com-G Normal value until flicker is reduced to minimal by →, ← key.
6. Change the input signal to the XGA, R-single color, 80 %, flat-field signal.
7. Move the cursor key until it is positioned at Vcom-R Normal.
8. Adjust the V com-R Normal value until flicker is reduced to minimal by →, ← key.
9. Change the input signal to the XGA, B-single color, 80 %, flat-field signal.
10. Move the cursor key until it is positioned at Vcom-B Normal.
11. Adjust the V com-B Normal value until flicker is reduced to minimal by →, ← key.
12. Reverse the “Image Flip” upside-down and right-to-left, and repeat the above adjustment procedure from step 2 to step 11.



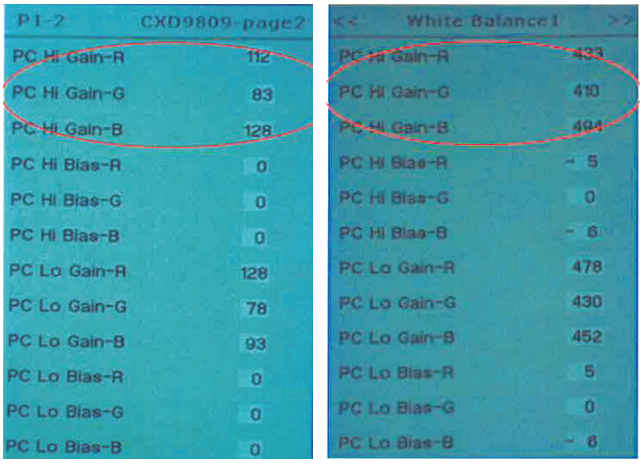
2-6. White Balance Adjustment

Preparation before adjustment

Input the 100 % flat field signal to the INPUT A connector and allow the warm-up of 10 minutes aging at a minimum.

2-6-1. HIGH Mode of PC

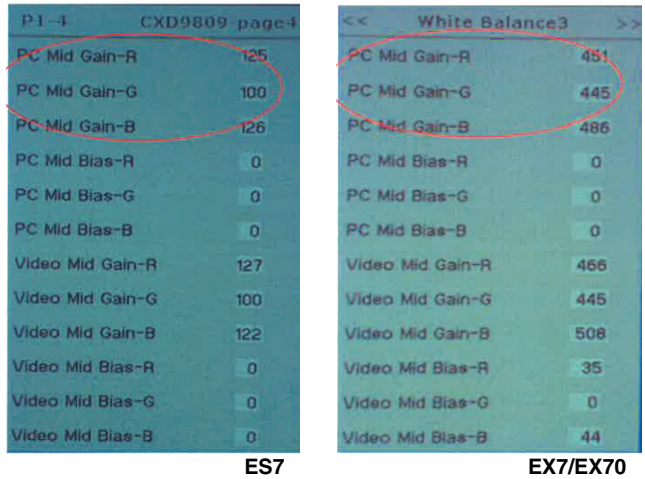
1. Input the 80 % flat field computer signal to the INPUT-A connector.
2. Set the picture quality mode to STANDARD, and set color temperature to HIGH.
3. The target chromaticity (x, y) is (0.282, 0.299).
4. Enter the service mode and change to CXD9809-Page 2 (ES7) or White Balance 1 page (EX7/EX70).
5. Adjust the PC Hi Gain-R and PC Hi Gain-B until the target chromaticity (x, y) as shown is obtained.
6. Repeat steps 2 to 5 until the chromaticity (x ±0.002, y ±0.002) with reference to the target chromaticity (x, y) is obtained.



ES7 EX7/EX70

2-6-2. MIDDLE Mode of PC

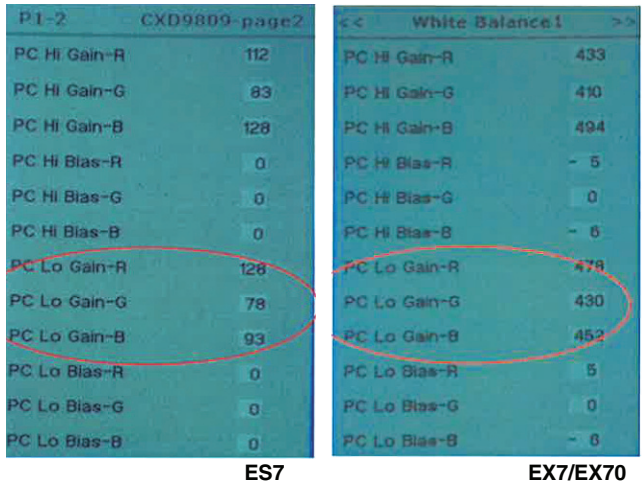
1. Input the 80 % flat field computer signal to the INPUT-A connector.
2. Set the picture quality mode to STANDARD, and set color temperature to MIDDLE.
3. The target chromaticity (x, y) is (0.390, 0.321).
4. Enter the service mode and change to CXD9809-Page4 (ES7) or White Balance 3 page (EX7/EX70).
5. Adjust the PC Mid Gain-R and PC Mid Gain-B until the target chromaticity (x, y) is obtained.
6. Repeat steps 2 to 5 until the chromaticity (x ±0.002, y ±0.002) with reference to the target chromaticity (x, y) is obtained.



ES7 EX7/EX70

2-6-3. LOW Mode of PC

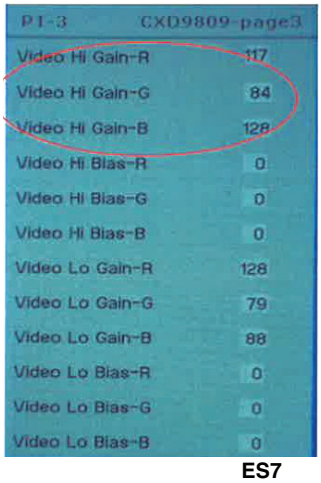
1. Input the 80 % flat field computer signal to the INPUT-A connector.
2. Set the picture quality mode to STANDARD, and set color temperature to LOW.
3. The target chromaticity (x, y) is (0.312, 0.334).
4. Enter the service mode and change to CXD9809-Page 2 (ES7) or White Balance 1 page (EX7/EX70).
5. Adjust the PC Lo Gain-R and PC Lo Gain-B until the target chromaticity (x, y) is obtained.
6. Repeat steps 2 to 5 until the chromaticity (x ±0.002, y ±0.002) with reference to the target chromaticity (x, y) is obtained.



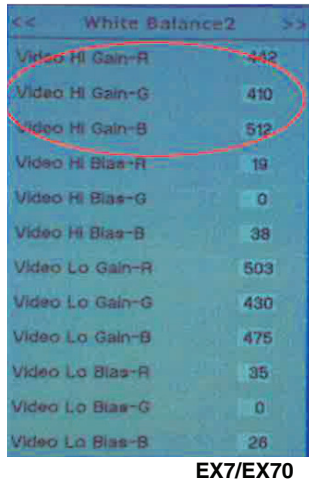
ES7 EX7/EX70

2-6-4. HIGH Mode of VIDEO

1. Input the 80 % flat field 480/60i or 575/50i signal to the INPUT A connector.
2. Set the picture quality mode to STANDARD, and set color temperature to HIGH.
3. The target chromaticity (x, y) is (0.282, 0.299).
4. Enter the service mode and change to CXD9809-Page 3 (ES7) or White Balance 2 page (EX7/EX70).
5. Adjust the PC Hi Gain-R and PC Hi Gain-B until the target chromaticity (x, y) is obtained.
6. Repeat steps 2 to 5 until the chromaticity (x ±0.002, y ±0.002) with reference to the target chromaticity (x, y) is obtained.



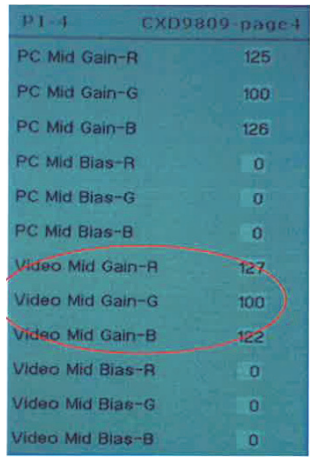
ES7



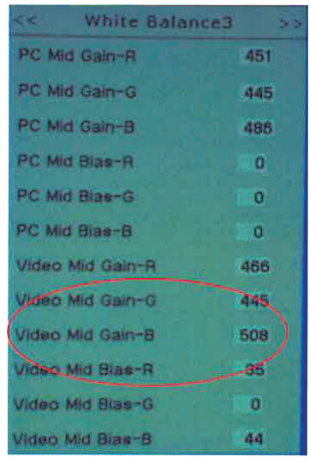
EX7/EX70

2-6-5. MIDDLE Mode of VIDEO

1. Input the 80 % flat field 480/60i or 575/50i signal to the INPUT A connector.
2. Set the picture quality mode to STANDARD, and set color temperature to MIDDLE.
3. The target chromaticity (x, y) is (0.390, 0.321).
4. Enter the service mode and change to CXD9809-Page 4 (ES7) or White Balance 3 page (EX7/EX70).
5. Adjust the PC Mid Gain-R and PC Mid Gain-B until the target chromaticity (x, y) is obtained.
6. Repeat steps 2 to 5 until the chromaticity (x ±0.002, y ±0.002) with reference to the target chromaticity (x, y) is obtained.



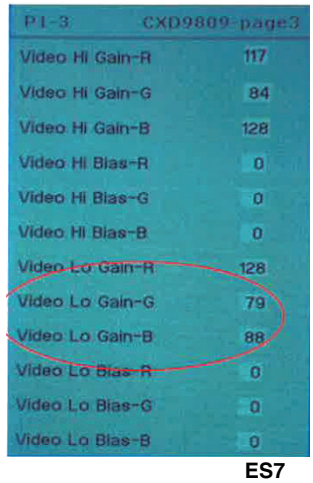
ES7



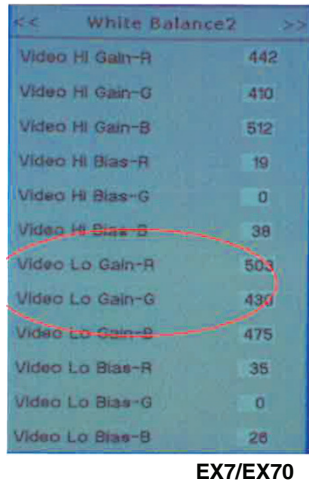
EX7/EX70

2-6-6. LOW Mode of VIDEO

1. Input the 80 % flat field 480/60i or 575/50i signal to the INPUT A connector.
2. Set the picture quality mode to STANDARD, and set color temperature to LOW.
3. The target chromaticity (x, y) is (0.312, 0.224).
4. Enter the service mode and change to CXD9809-Page 3 (ES7) or White Balance 2 page (EX7/EX70).
5. Adjust the PC Lo Gain-R and PC Lo Gain-B until the target chromaticity (x, y) is obtained.
6. Repeat steps 2 to 5 until the chromaticity (x ±0.002, y ±0.002) with reference to the target chromaticity (x, y) is obtained.



ES7



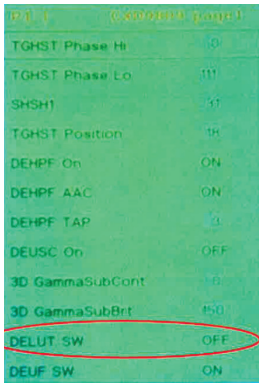
EX7/EX70

2-7. Others

2-7-1. Note When Replacing the Main Board

The new Main board of VPL-ES7 is shipped with the 3D Gamma set to OFF.
After replacing the Main board and upon completion of adjustment, set the 3D Gamma setting to ON.
For the VPL-EX7/EX70, the following work is not necessary since the projector is shipped from the factory with the 3D Gamma set to ON.

1. Enter the Factory Mode and display page 1.
2. Move the cursor to DELUT SW.
3. Operate the [→] key and set the 3D Gamma setting to ON.



How to Enter the Factory Mode

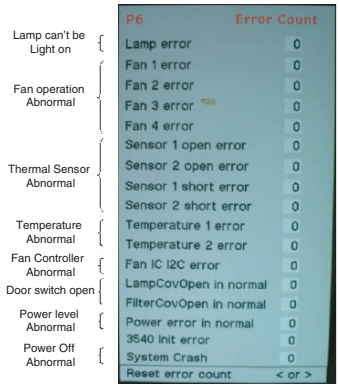
1. Power on the projector.
2. Push the switches on the remote controller or controller panel as below.
   [Enter] → [Enter] → [←] → [PIC MUTING] key
3. Factory mode menu will appear on the screen.

Note

In the factory mode, do not enter any items except the specified one because the data cannot be returned back to the original value if it is changed once.

2-7-2. Status Information

The error status count is displayed.

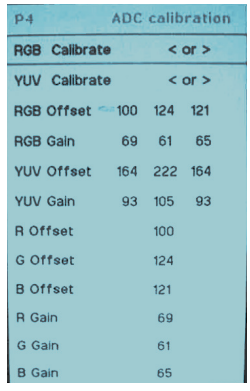


ES7

EX7/EX70

2-7-3. ADC Calibration Value

- RGB Offset : Offset value of computer signal
- RGB Gain : Gain adjustment of computer signal
- YUV Offset : Offset value of video signal
- YUV Gain : Gain adjustment of video signal



2-8. Initial Values of Adjustment Items

				VIDEO						S VIDEO						INPUT A (Component/VideoGBR)						INPUT A (Computer), INPUT B (Computer)					
		Set		Dynamic	Standard	Game	Living	Cinema	Present-ation	Dynamic	Standard	Game	Living	Cinema	Present-ation	Dynamic	Standard	Game	Living	Cinema	Present-ation	Dynamic	Standard	Game	Living	Cinema	Present-ation
PICTURE SETTING	Picture Mode				∗3						∗3						∗3						∗3				
	Adjust Picture																										
	Contrast			90	80	90	90	75	85	90	80	90	90	75	75	90	80	90	90	75	85	90	80	90	90	60	85
	Bright			60	50	60	50	50	55	60	50	60	50	50	55	60	50	60	50	50	55	60	50	60	50	50	55
	Color			50	50	68	60	58	50	50	50	68	60	58	50	50	50	68	60	58	50						
	Hue			50	50	50	50	50	50	50	50	50	50	50	50												
	Sharpness			60	30	50	50	30	50	60	30	40	40	30	40	60	30	40	40	30	40						
	DDE			Film	Film	Film	Film	Film	Film	Film	Film	Film	Film	Film	Film	Film	Film	Film	Film	Film	Film						
	Gamma Mode																					Graphics	Graphics	Graphics	Graphics	Graphics	Graphics
	Color Temp			High	Low	High	Low	Low	High	High	Low	High	Low	Low	High	High	Low	High	Low	Low	High	High	Low	High	Low	Low	
	Volume	30																									
INPUT SETTING	Adjust Signal																										
	Dot Phase	31																									
	H Size																										
	Shift																										
	Aspect	refer to Aspect Default																									
SET SETTING	Smart APA	On																									
	Auto Input Search	Off																									
	Input-A Signal Sel.	Auto																									
	Color System	Auto																									
	Power Saving Mode	Off																									
	Panel Key Lock	Off																									
	CC Display	Off																									
	Lamp Timer Reset																										
MENU SETTING	Status	On																									
	Language	English																									
	Menu Position	Center																									
	Start Up Image	On																									
INSTALL SETTING	Auto Keystone ∗1	Auto																									
	Keystone ∗1	0																									
	V Keystone ∗2	0																									
	Image Flip	Off																									
	Background	Blue																									
	Lamp Mode	Standard																									
	High Altitude Mode	Off																									
	Security Lock	Off																									
	Key	Enter x 4																									
	Direct Power On	Off																									
INFORMATION	All information is display only																										

∗1: VPL-EX70 only.
∗2: VPL-ES7/EX7 only.
∗3: The “Picture Mode” items in the “PICTURE SETTING” menu have their respective initial values for each input signal (PRESET MEMORY No.).

Note

There are some adjustment items that cannot be adjusted, depending on the input signal.

No.		Preset Signal		SVGA(ES7) / XGA(EX7/EX70)		
				PC	Component	Video GBR
1		VIDEO/60	60Hz	-	4:3 / Normal	4:3 / Normal
2		VIDEO/50	50Hz	-	4:3 / Normal	4:3 / Normal
3		480/60i	480/60i	-	4:3 / Normal	4:3 / Normal
4		575/50i	575/50i	-	4:3 / Normal	4:3 / Normal
5		480/60p	480/60p (progressive component)	-	4:3 / Normal	4:3 / Normal
6		575/50p	575/50p (progressive component)	-	4:3 / Normal	4:3 / Normal
7		1080/60i	1035/60i, 1080/60i	-	16:9 / Full	16:9 / Full
8		1080/50i	1080/50i	-	16:9 / Full	16:9 / Full
10		720/60p	720/60p	Full1	16:9 / Full	16:9 / Full
11		720/50p	720/50p	-	16:9 / Full	16:9 / Full
21	*	640x350	VGA mode1	Full1	-	-
22	*		VGA VESA 85Hz			
23	*	640x400	NEC PC98	Full1	-	-
24	*		VGA mode 2			
25	*		VGA VESA 85Hz			
26	*	640x480	VGA mode 3	Full1	4:3 / Normal	4:3 / Normal
27	*		Macintosh 13"			
28	*		VGA VESA 72Hz			
29	*		VGA VESA 75Hz (IBM M3)			
30	*		VGA VESA 85Hz			
31	*	800x600	SVGA VESA 56Hz	Full1	-	-
32	*		SVGA VESA 60Hz			
33	*		SVGA VESA 72Hz			
34	*		SVGA VESA 75Hz			
35	*		SVGA VESA 85Hz			
36	*	832x624	Macintosh 16"	Full1	-	-
37	*	1024x768	XGA VESA 60Hz	Full1	-	-
38	*		XGA VESA 70Hz			
39	*		XGA VESA 75Hz			
40	*		XGA VESA 85Hz			
41	*	1152x864	SXGA VESA 70Hz	Full1	-	-
42			SXGA VESA 75Hz			
43			SXGA VESA 85Hz			
44	*	1152x900	SUN LO	Full1	-	-
45	*	1280x960	SXGA VESA 60Hz	Full1	-	-
46			SXGA VESA 75Hz			
47	*	1280x1024	SXGA VESA 60Hz	Full1	-	-
48			SXGA VESA 75Hz			
49	*		SXGA VESA 85Hz			
50		1400x1050	SXGA+ 60Hz	Full1	-	-
55		1280x768	WXGA 60Hz	Full1	-	-
56		1280x720p	WXGA 60Hz	Full1	16:9 / Full	16:9 / Full
60		1360x768	1360x768/60	Full1	-	-
61		1440x900	1440x900/60	Full1	-	-
63		1280x800	1280x800/60	Full1	-	-

		Set		Color		
Page	Item Name	ES7	EX7/EX70	R	G	B
White Balance1 CXD9809 (ES7) CXD3548 (EX7/EX70) page1	PC Hi Gain-R	128	512			
	PC Hi Gain-G	128	512			
	PC Hi Gain-B	128	512			
	PC Hi Bias-R	0				
	PC Hi Bias-G	0				
	PC Hi Bias-B	0				
	PC Lo Gain-R	128	512			
	PC Lo Gain-G	70	280			
	PC Lo Gain-B	100	400			
	PC Lo Bias-R	0				
	PC Lo Bias-G	0				
	PC Lo Bias-B	0				
White Balance2 CXD9809 (ES7) CXD3548 (EX7/EX70) page2	Video Hi Gain-R	128	512			
	Video Hi Gain-G	80	320			
	Video Hi Gain-B	120	480			
	PC Mid Bias-R	0				
	Video Hi Bias-G	0				
	Video Hi Bias-B	0				
	Video Lo Gain-R	128	512			
	Video Lo Gain-G	70	280			
	Video Lo Gain-B	100	400			
	Video Lo Bias-R	0				
	Video Lo Bias-G	0				
	Video Lo Bias-B	0				
White Balance3 CXD9809 (ES7) CXD3548 (EX7/EX70) page3	PC Mid Gain-R	128	512			
	PC Mid Gain-G	90	360			
	PC Mid Gain-B	115	460			
	PC Mid Bias-R	0				
	PC Mid Bias-G	0				
	PC Mid Bias-B	0				
	Video Mid Gain-R	128	512			
	Video Mid Gain-G	75	300			
	Video Mid Gain-B	105	420			
	Video Mid Bias-R	0				
	Video Mid Bias-G	0				
	Video Mid Bias-B	0				

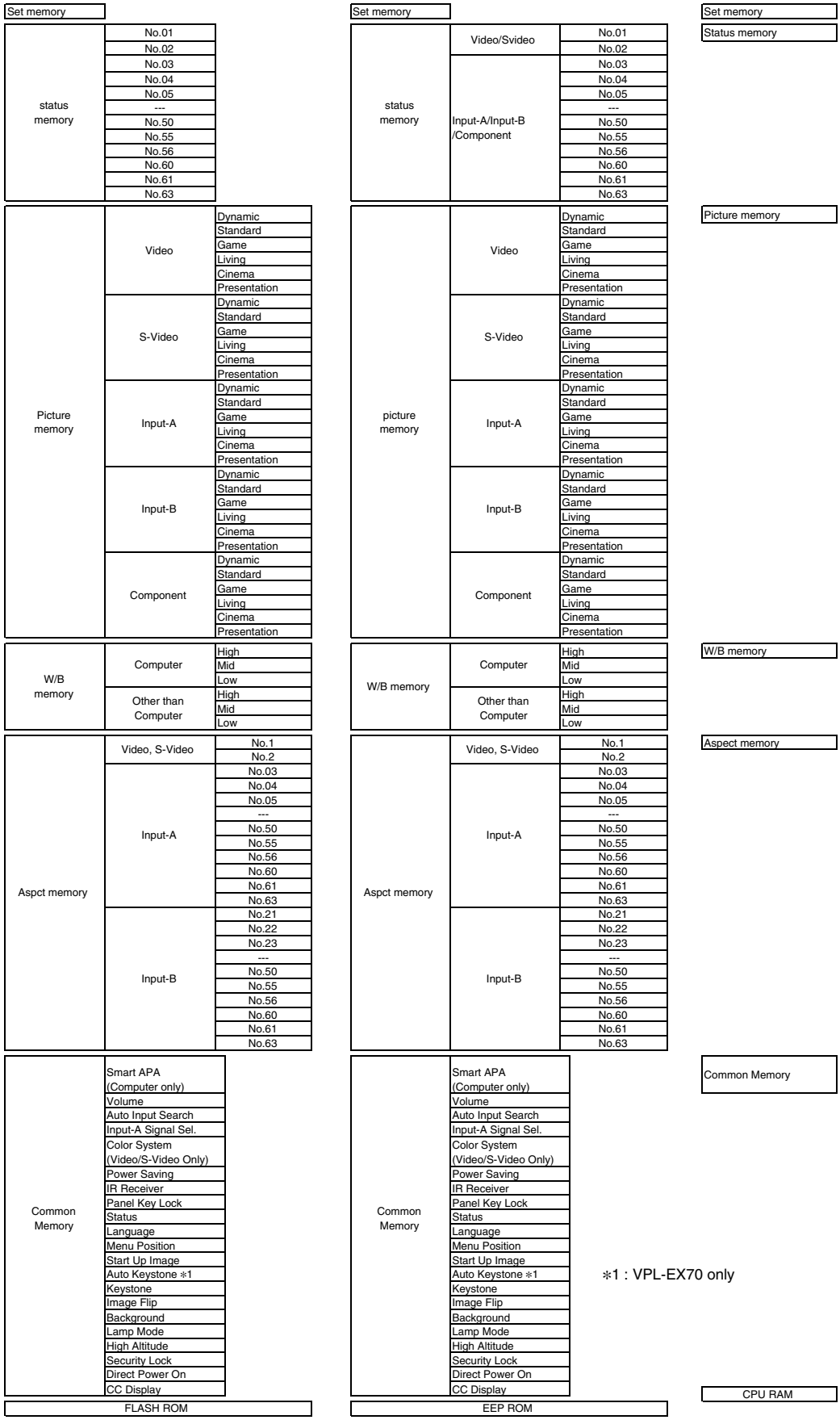
		Set		Color		
Page	Item Name	ES7	EX7/EX70	R	G	B
Vcom & Misc CXA7006 (ES7) CXA7009 (EX7/EX70) page4	Vcom-R Normal	88	83			
	Vcom-G Normal	88	83			
	Vcom-B Normal	88	83			
	Vcom-R Flip	88	83			
	Vcom-G Flip	88	83			
	Vcom-B Flip	88	83			
	EDID Write Protect	ON				
	ROM Version	1.00				

ADC Calibration	RGB Calibrate				
	YUV Calibrate				
	RGB Offset		164	222	164
	RGB Gain		93	105	93
	YUV Offset		164	222	164
	YUV Gain		93	105	93
	R Offset	164			
	G Offset	222			
	B Offset	164			
	R Gain	93			
	G Gain	105			
	B Gain	93			

Error Count	All value is display only

Keystone Adjustment (VPL-EX70 only)	average time	—	Display only
	Current Y Axis	—	Display only
	Current Tout counts	—	Display only
	Save T1 data	—	
	T1:	—	1
	Axis1:	—	1
	Save T2 data	—	
	T2:	—	1
	Axis2:	—	1
	set manual 'b' left key x	—	1000
	a	—	1
	b	—	1
	Calculate sensitivity	—	
	sensitivity	—	1
	current g	—	Display only

2-9. Memory Structure



Memory structure of this model consists of the followings.

1 Set memory
2 Status memory
3 Picture memory
4 Chroma memory
5 W/B memory
6 Channel memory

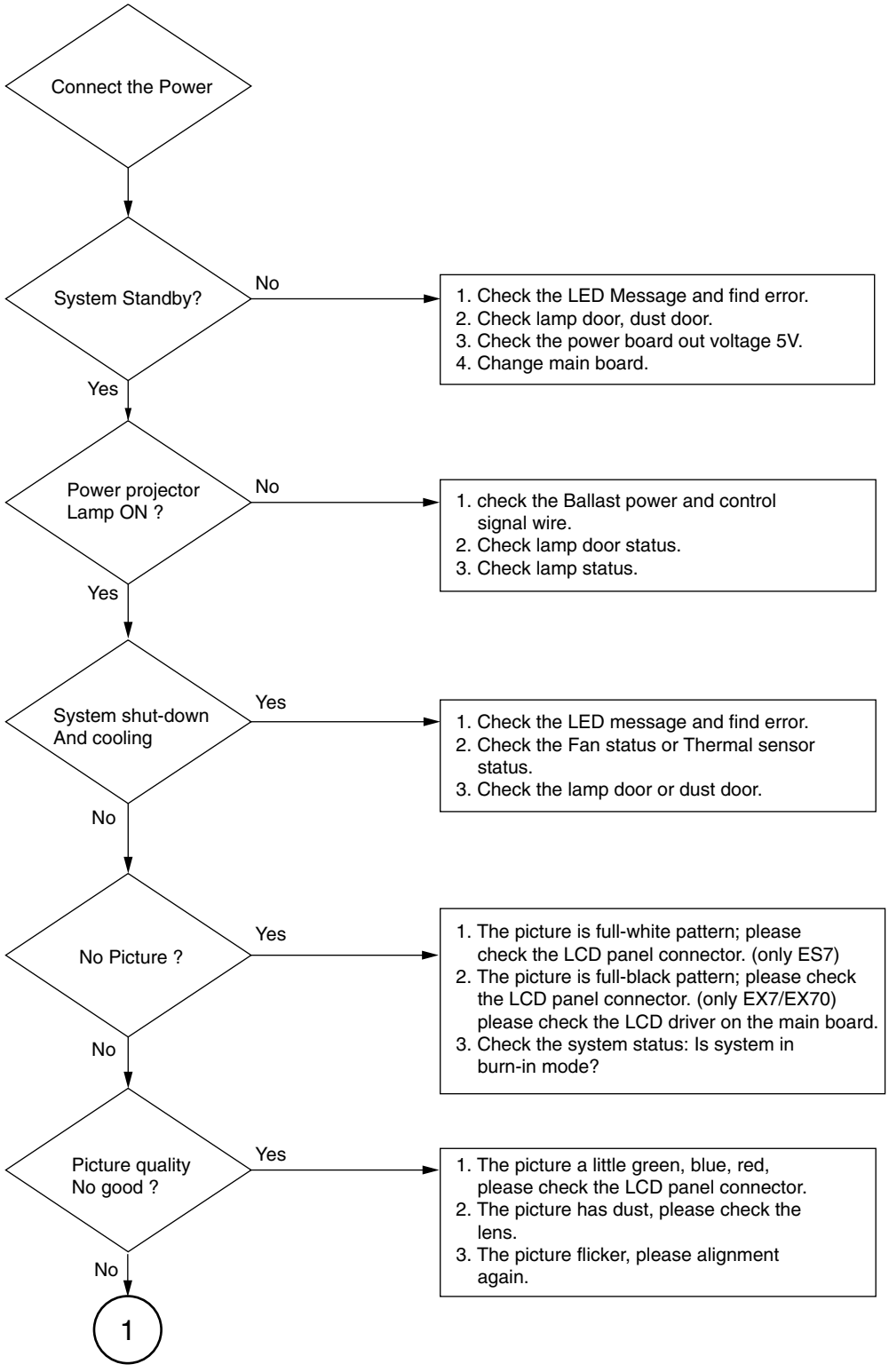
∗ The gamma memory is realized by giving offset to the Contrast and Brightness output values to the devices in the gamma mode function.

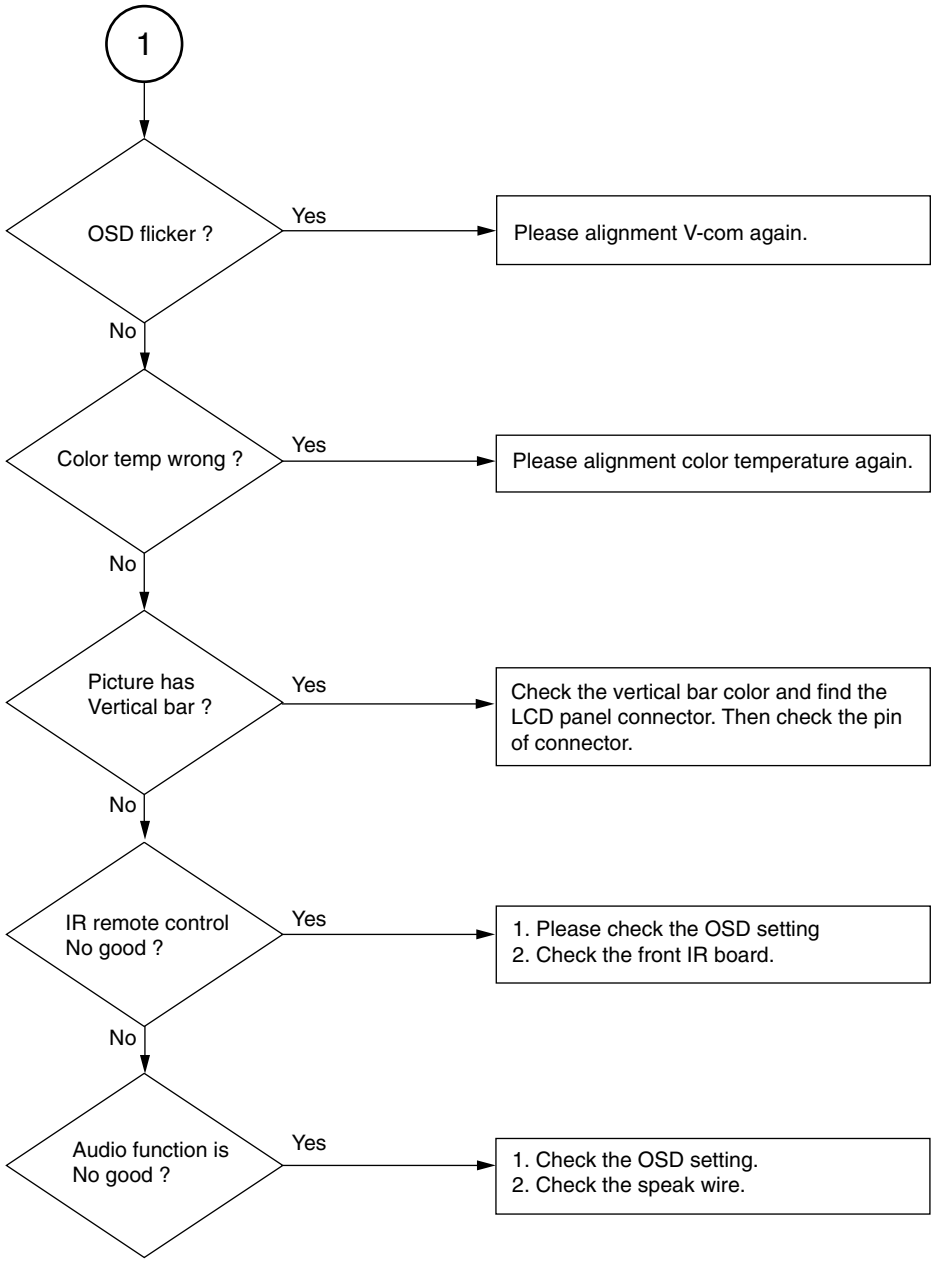
Flow of data is described briefly. When the power plug is connected to the wall outlet for the first time (Standby state), all data that are stored in the internal ROM are written in the NVM (non-volatile memory). When the POWER is turned ON, all the status memory data and other memory data that are required for the present picture are selected from each memory block and expanded in the internal RAM.
When any adjustment is performed at this moment, the adjustment data (user mode items) are written in the NVM automatically triggered by the memory operation.

The adjustment items (W/B, V com) that can be adjusted in the Service Mode, are memorized in the NVM at the time when the user performs adjustment and performs the memory operation. Note that the factory adjustment data will be lost at this moment.

Section 3
Troubleshooting

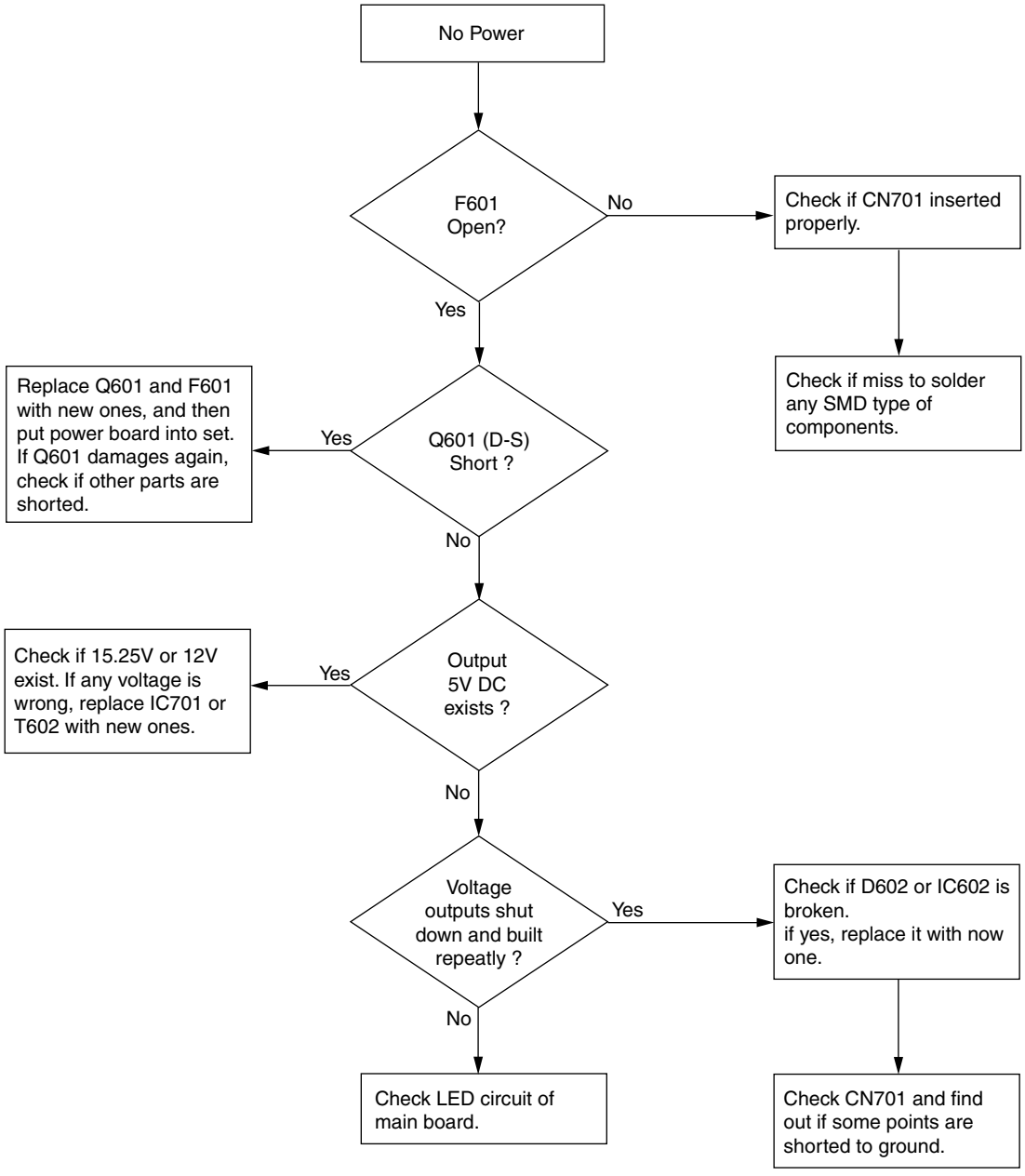
3-1. Electric Troubleshooting


Connect the Power
System Standby?
No
1. Check the LED Message and find error.
2. Check lamp door, dust door.
3. Check the power board out voltage 5V.
4. Change main board.
Yes
Power projector
Lamp ON ?
No
1. check the Ballast power and control signal wire.
2. Check lamp door status.
3. Check lamp status.
Yes
System shut-down
And cooling
Yes
1. Check the LED message and find error.
2. Check the Fan status or Thermal sensor status.
3. Check the lamp door or dust door.
No
No Picture ?
Yes
1. The picture is full-white pattern; please check the LCD panel connector. (only ES7)
2. The picture is full-black pattern; please check the LCD panel connector. (only EX7/EX70) please check the LCD driver on the main board.
3. Check the system status: Is system in burn-in mode?
No
Picture quality
No good ?
Yes
1. The picture a little green, blue, red, please check the LCD panel connector.
2. The picture has dust, please check the lens.
3. The picture flicker, please alignment again.
No
1

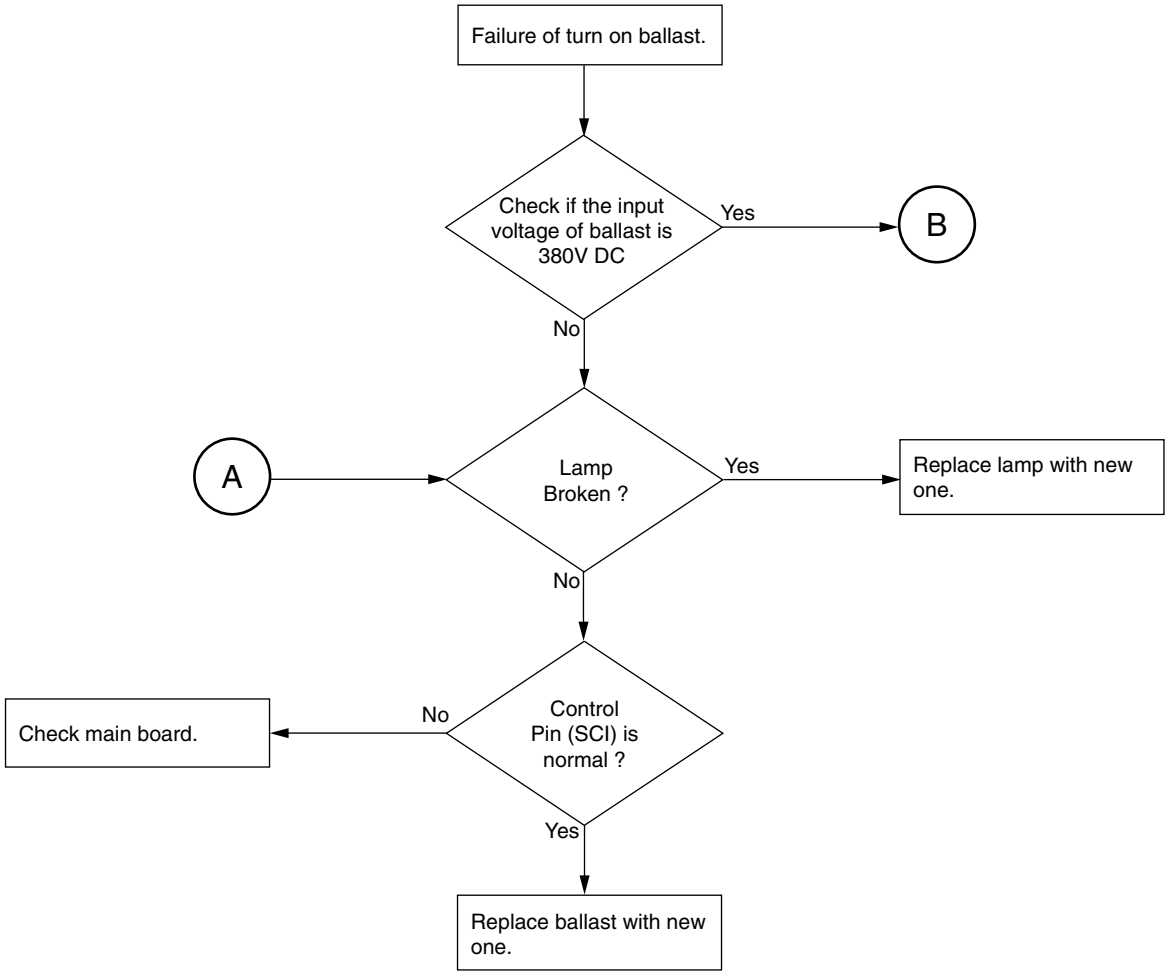

1
OSD flicker ?
Yes
Please alignment V-com again.
No
Color temp wrong ?
Yes
Please alignment color temperature again.
No
Picture has
Vertical bar ?
Yes
Check the vertical bar color and find the LCD panel connector. Then check the pin of connector.
No
IR remote control
No good ?
Yes
1. Please check the OSD setting
2. Check the front IR board.
No
Audio function is
No good ?
Yes
1. Check the OSD setting.
2. Check the speak wire.

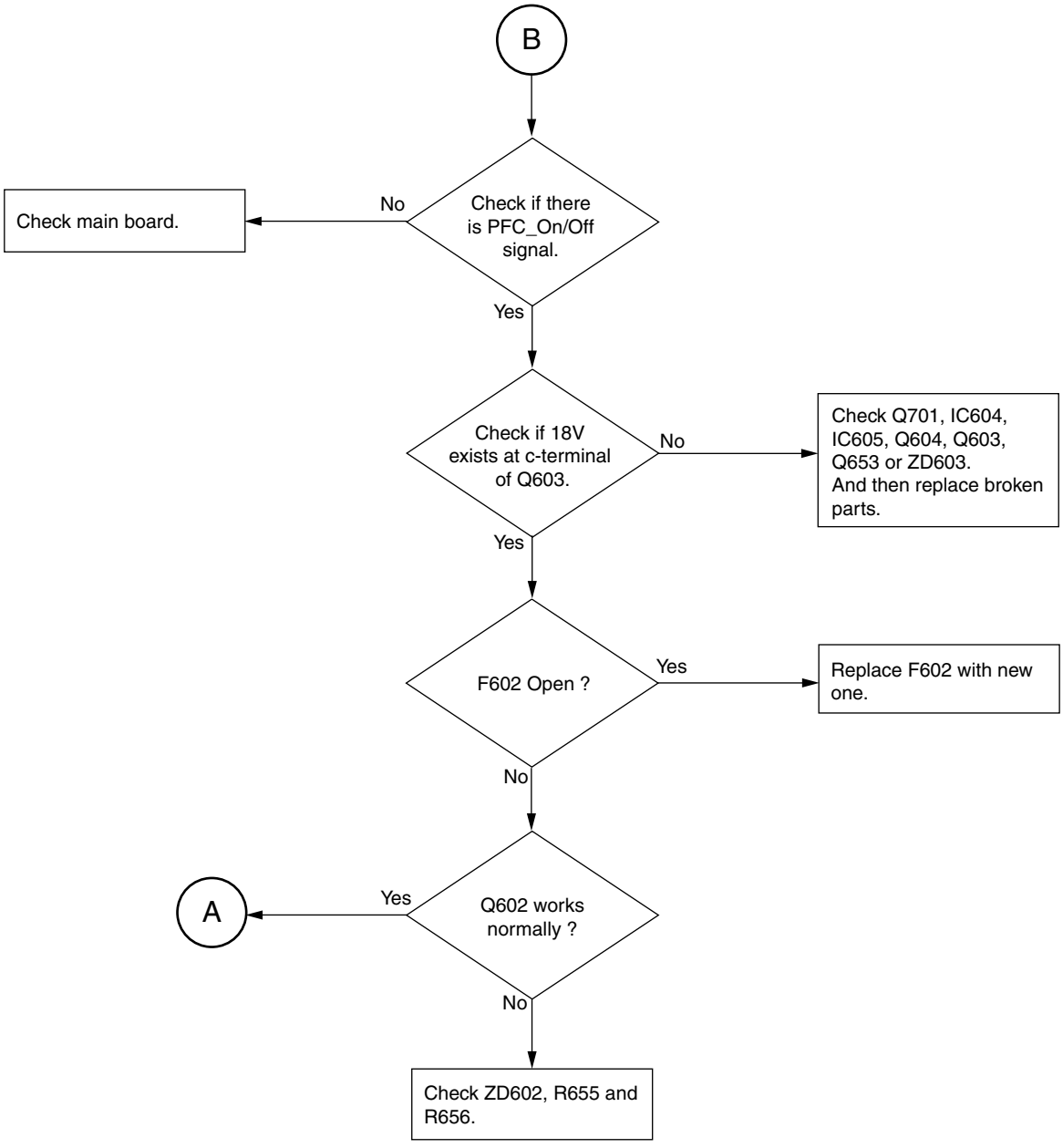
3-2. Power Board Troubleshooting

3-2-1. No Power

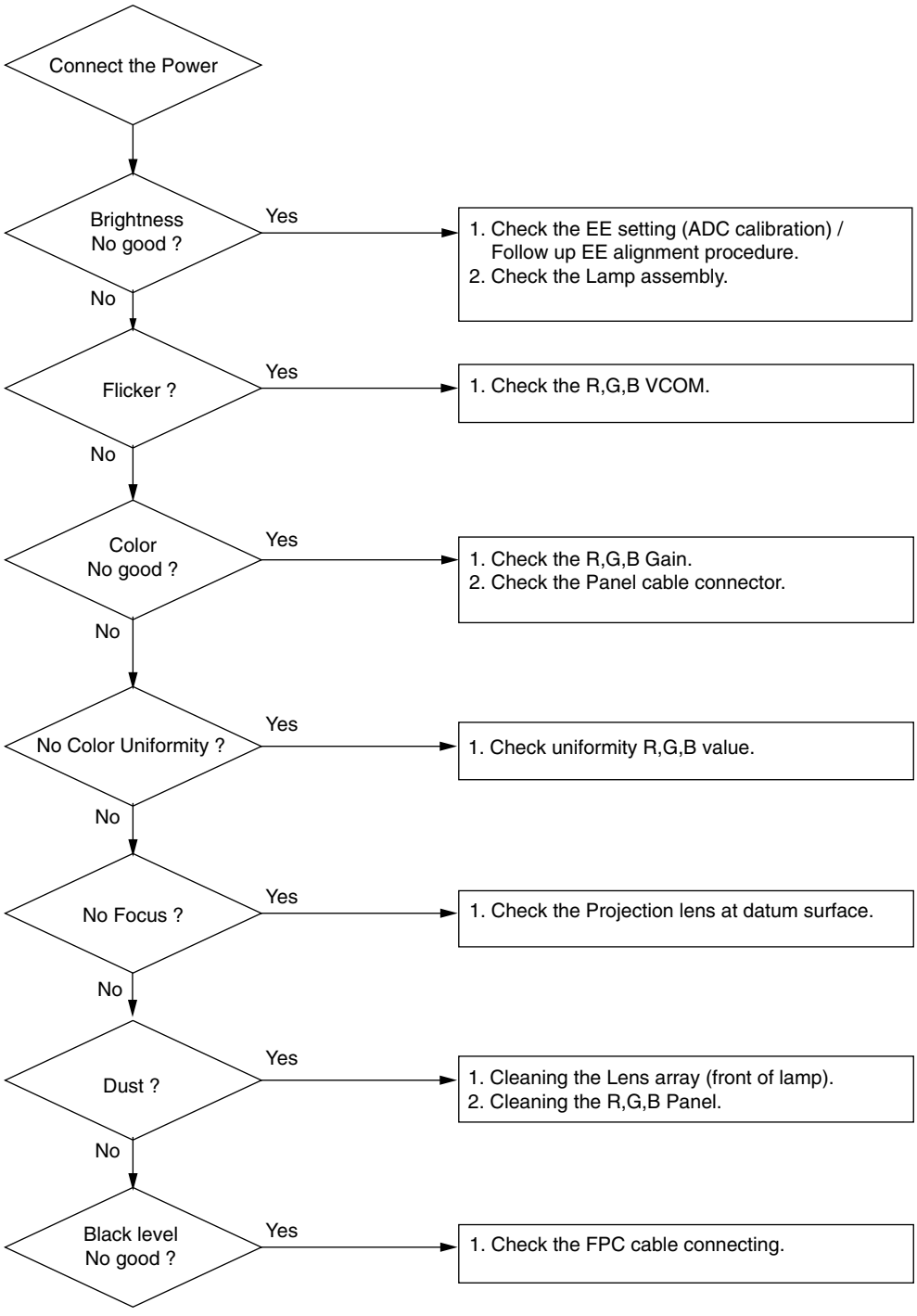

No Power
F601 Open?
No
Check if CN701 inserted properly.
Check if miss to solder any SMD type of components.
Yes
Q601 (D-S) Short ?
Yes
Replace Q601 and F601 with new ones, and then put power board into set. If Q601 damages again, check if other parts are shorted.
No
Output 5V DC exists ?
Yes
Check if 15.25V or 12V exist. If any voltage is wrong, replace IC701 or T602 with new ones.
No
Voltage outputs shut down and built repeatly ?
Yes
Check if D602 or IC602 is broken.
if yes, replace it with now one.
No
Check LED circuit of main board.
Check CN701 and find out if some points are shorted to ground.

3-2-2. Failure of Turn on Lamp




B
Check if there is PFC_On/Off signal.
No
Check main board.
Yes
Check if 18V exists at c-terminal of Q603.
No
Check Q701, IC604, IC605, Q604, Q603, Q653 or ZD603. And then replace broken parts.
Yes
F602 Open ?
Yes
Replace F602 with new one.
No
Q602 works normally ?
Yes
A
No
Check ZD602, R655 and R656.

3-3. Optical Troubleshooting



Section 4
Spare Parts

4-1. Notes on Repair Parts

1. Safety Related Components Warning

WARNING

Components marked ⚠ are critical to safe operation. Therefore, specified parts should be used in the case of replacement.

WARNHINWEIS

Les composants identifiés par la marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

2. Standardization of Parts

Some repair parts supplied by Sony differ from those used for the unit. These are because of parts commonality and improvement.
Parts List has the present standardized repair parts.

3. Stock of Parts

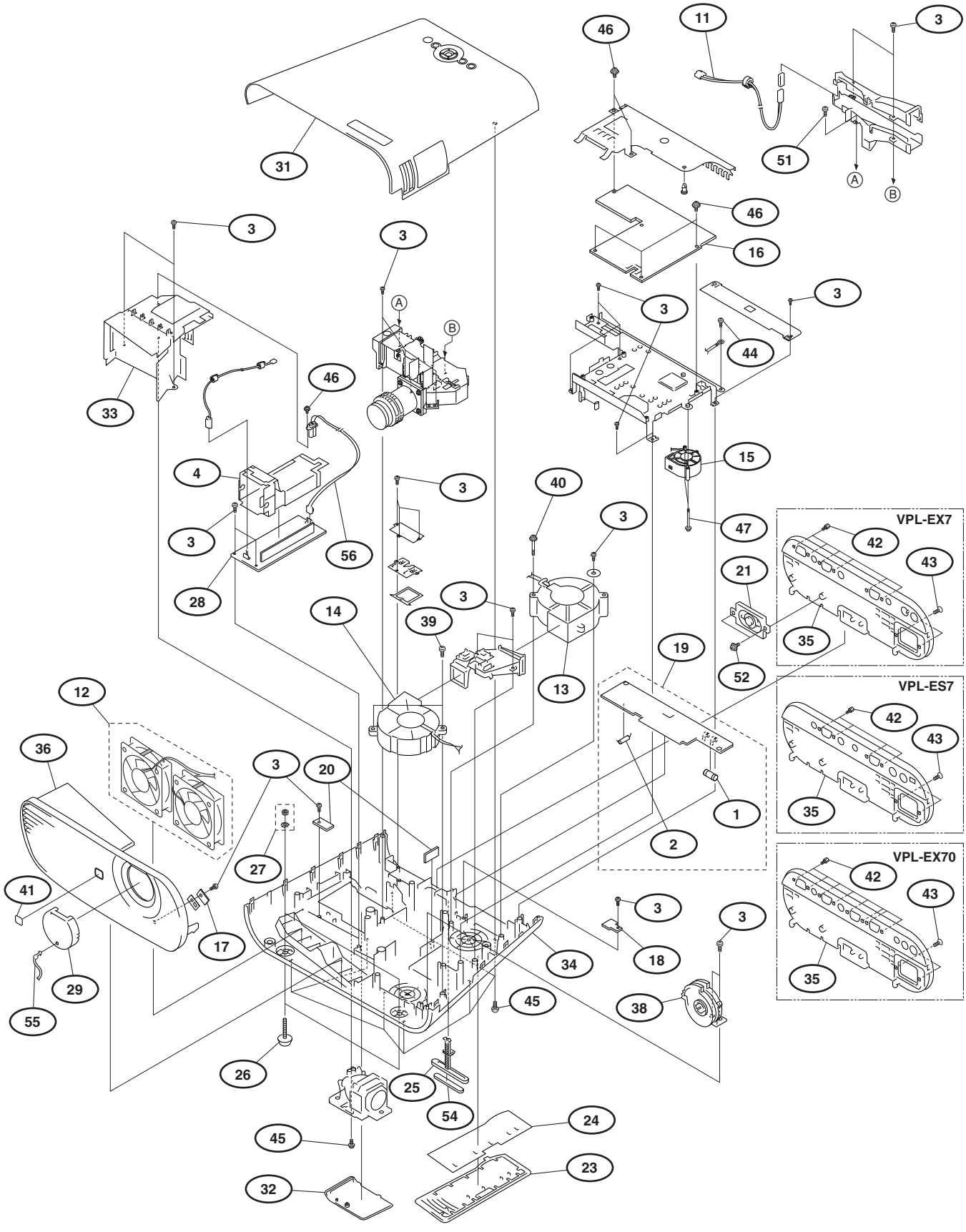
Parts marked with “o” at SP (Supply Code) column of the Spare Parts list may not be stocked. Therefore, the delivery date will be delayed.
Items with no part number and no description are not stocked because they are seldom required for routine service.

4. Units for Capacitors, Inductors and Resistors

The following units are assumed in Schematic Diagrams, Electrical Parts List and Exploded Views unless otherwise specified.

Capacitors	: μF
Inductors	: μH
Resistors	: Ω

4-2. Exploded Views



No.		Part No.	SP	Description
1	⚠	1-576-233-51	s	FUSE (H.B.C.) (F601)
2	⚠	1-576-973-11	s	MINIATURE FUSE-LINKS (F602)
3		2-681-550-01	s	SCREW TAP PAN M3*7L NI D-PT
4		4-140-315-01	s	MYLAR BALLAST
11		9-885-118-05	s	WIRE 2P_CON+THERMAL 145MM E08X
12	⚠	1-787-869-11	s	FAN*2 80*25 AD0812HB/HB
13	⚠	1-787-872-11	s	FAN 75*75*30 145MM AB7512UB
14	⚠	1-787-871-11	s	FAN 70*70*25 240MM AB07012UB
15	⚠	1-787-870-11	s	FAN 60*60*25 183MM AB0612HB
16		1-857-422-11	s	PCBA MAIN BD 6L E09X MI (VPL-EX70)
		1-857-424-11	s	PCBA MAIN BD 6L E09XJR MI (VPL-EX7)
		1-857-423-11	s	PCBA MAIN BD MI 6L (VPL-ES7)
17		9-885-118-14	s	PCBA IR BD E08X MI
18		1-789-544-11	s	PCBA THERMAL SENSOR BD MI
19		1-857-381-11	s	PCBA POWER BD MI E08W
20		9-885-118-17	s	PCBA SWITCH BD E08X MI
21		9-885-118-18	s	SPK 2W8OHM 130MM W4028CP-130
23		9-885-118-22	s	DOOR FILTER PC E08X
24		9-885-118-23	s	MESH FILTER E08X
25		9-885-118-24	s	ASSY ADJ FOOT E08X
26		9-885-118-26	s	RUBBER FRONT FOOT E08X
27		9-885-118-27	s	NUT HEX+WASHER M3*2.3H NI
28	⚠	1-487-368-11	s	BALLAST EUC200DW/C01 E09
29		9-885-118-29	s	CAP LENS PC E08X
31		4-140-316-01	s	ASSY UPPER CASE
32		4-140-317-01	s	LAMP DOOR
33		4-140-318-01	s	ASSY LAMP BOX
34		4-140-319-01	s	PACK ASSY LOWER CASE
35		4-140-320-01	s	PACK ASSY REAR CASE E09X (VPL-EX70)
		4-140-321-01	s	PACK ASSY REAR CASE E09XJR (VPL-EX7)
		4-141-652-01	s	PACK ASSY REAR CASE E09S (VPL-ES7)
36		4-140-323-01	s	ASSY FRONT CASE
38		9-885-118-41	s	ASSY ADJUST GEAR E08 E08X
39		9-885-118-42	s	SCRW TAP PH W/FLA M3*10L PT ZN
40		9-885-118-43	s	SCRW TAP PH W/FL M3*35 NI D-PT
41		4-140-324-01	s	LOGO E09X (VPL-EX70)
		4-140-325-01	s	LOGO E09XJR (VPL-EX7)
		4-140-326-01	s	LOGO E09S (VPL-ES7)
42		2-681-552-02	s	SCRW MACH HEX #4-40*4
43		7-682-250-09	s	SCRW +K 3X12
44		2-580-599-01	s	SCRW +PSW M4X6
45		3-918-696-11	s	SCRW (M3X6 LOCK ACE)
46		7-682-903-11	s	SCRW +PWH 3X6
47		7-682-954-01	s	SCRW +PSW M3X25
51		This part is not supplied as the repair part. If this part is broken or lost, the part reference No. 39 can be used.		
52		This part is not supplied as the repair part. If this part is broken or lost, the part reference No. 46 can be used.		
54		9-885-118-25	s	RUBBER PAD ADJ FOOT E08X
55		9-885-114-31	s	LENS WIRE CAP SL700X
56		1-910-057-82	s	LAMP CONNECTOR ASSY 4P

4-3. Electrical Parts List

Ref. No. or Q'ty	Part No.	SP	Description
1pc	⚠ 1-576-233-51	s	FUSE (H.B.C) (F601)
1pc	⚠ 1-576-973-11	s	MINITURE FUSE-LINKS (F602)

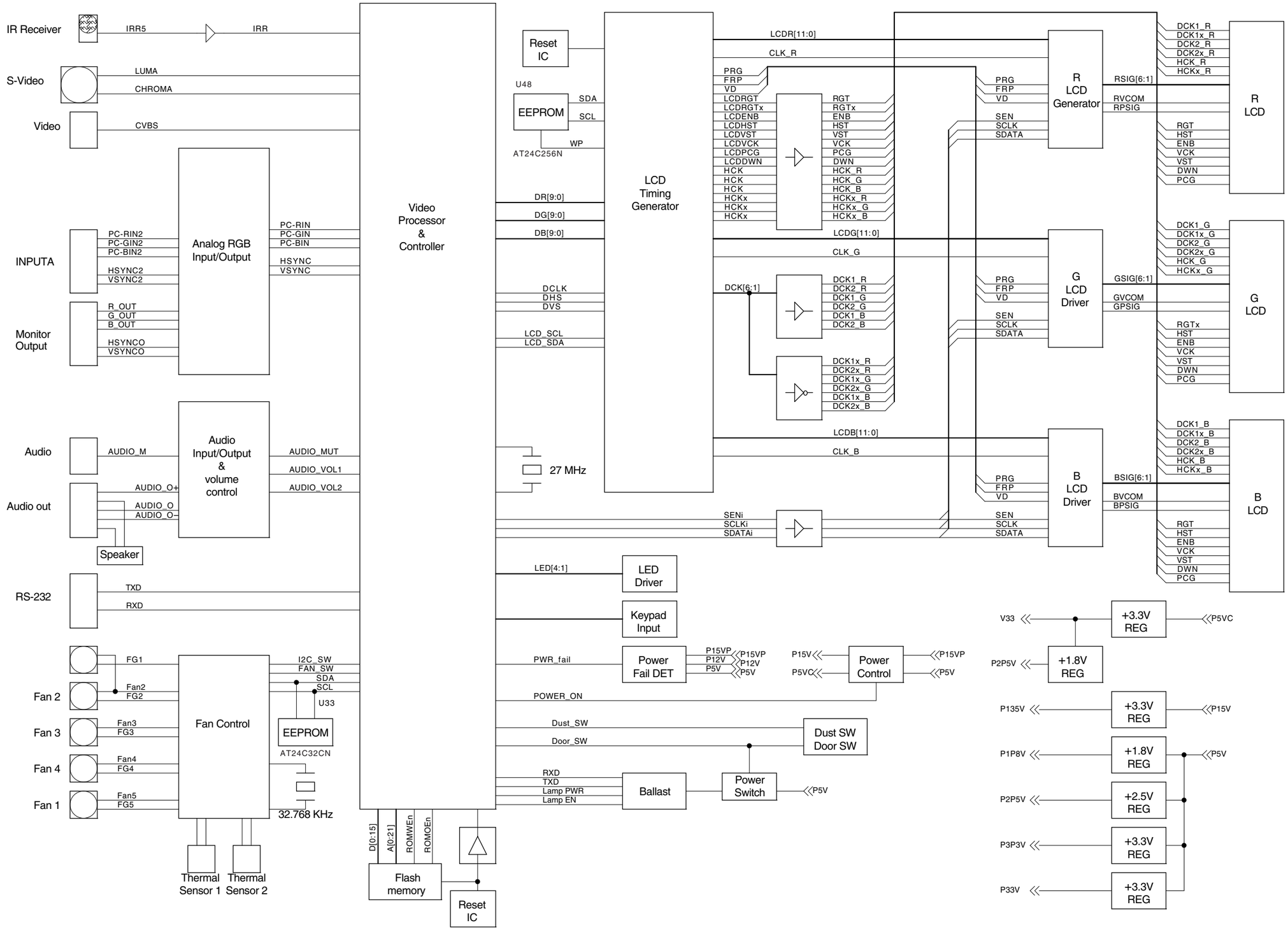
4-4. Packing Materials & Supplied Accessories

SUPPLIED ACCESSORIES

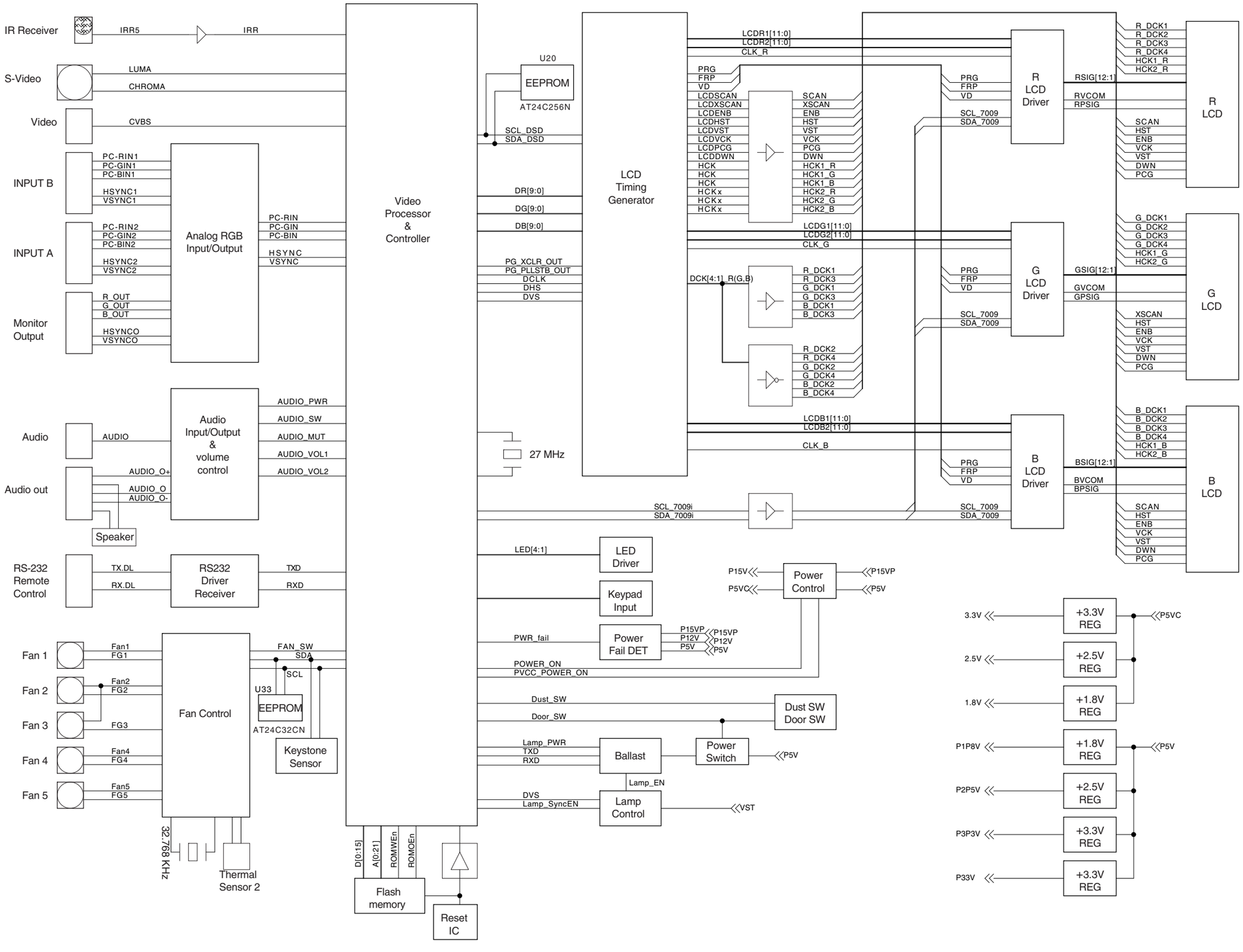
Ref. No. or Q'ty	Part No.	SP	Description
1pc	A-1568-125-A	s	QUICK ACCESS ASSY (VPL-ES7)
1pc	1-487-177-11	s	REMOTE RM-PJ6 E09
1pc	1-832-428-11	s	CABLE, VGA
1pc	9-885-118-30	s	BAG CARRY E08 SONY
1pc	4-135-544-01	s	CD-ROM MANUAL (VPL-ES7/EX7/EX70)
1pc	4-135-539-01	s	QUICK REFERENCE MANUAL (VPL-ES7/EX7/EX70) (EXCEPT VPL-ES7(CH)/VPL-EX70(CH)) (JAPANESE, ENGLISH, FRENCH, SPANISH, GERMAN, ITALIAN, SIMPLIFIED CHINESE)
1pc	4-135-541-81	s	OPERATING INSTRUCTIONS (VPL-EX70(CH))(SIMPLIFIED CHINESE)

Section 5
Block Diagrams

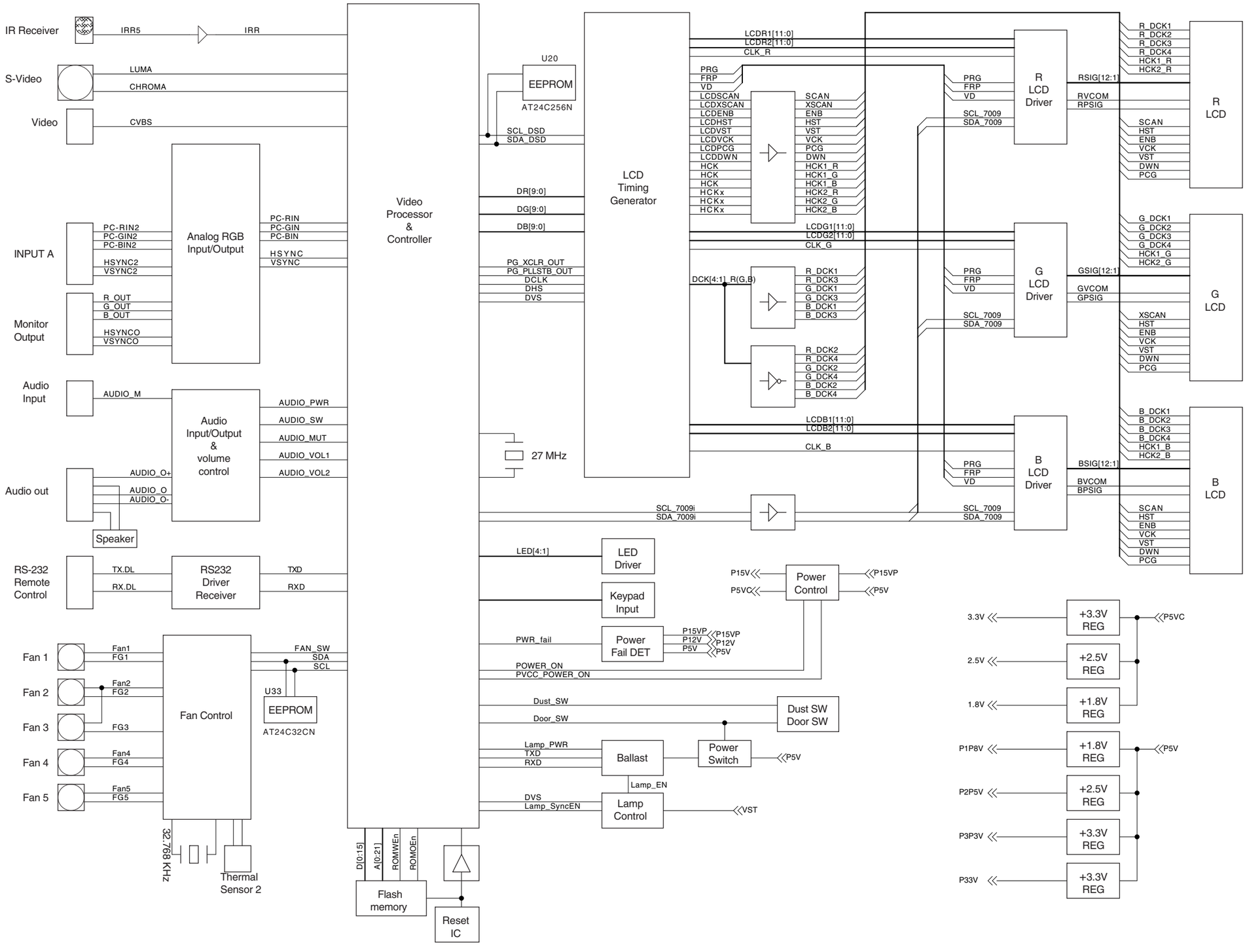
VPL-ES7



VPL-EX70


IR Receiver
IRR5
IRR
S-Video
LUMA
CHROMA
Video
CVBS
INPUT B
PC-RIN1
PC-GIN1
PC-BIN1
HSYNC1
VSYNC1
INPUT A
PC-RIN2
PC-GIN2
PC-BIN2
HSYNC2
VSYNC2
Monitor Output
R_OUT
G_OUT
B_OUT
HSYNCO
VSYNCO
Analog RGB Input/Output
PC-RIN
PC-GIN
PC-BIN
HSYNC
VSYNC
Video Processor & Controller
U20
EEPROM
AT24C256N
SCL_DSD
SDA_DSD
DR[9:0]
DG[9:0]
DB[9:0]
PG_XCLR_OUT
PG_PLLSTB_OUT
DCLK
DHS
DVS
27 MHz
LCD Timing Generator
LCDR1[11:0]
LCDR2[11:0]
CLK_R
PRG
FRP
VD
LCDSCAN
LCDXSCAN
LCDENB
LCDHST
LCDVST
LCDVCK
LCDPCG
LCDDWN
HCK
HCK
HCK
HCKx
HCKx
HCKx
SCAN
XSCAN
ENB
HST
VST
VCK
PCG
DWN
HCK1_R
HCK1_G
HCK1_B
HCK2_R
HCK2_G
HCK2_B
LCDG1[11:0]
LCDG2[11:0]
CLK_G
DCK[4:1]_R(G,B)
R_DCK1
R_DCK3
G_DCK1
G_DCK3
B_DCK1
B_DCK3
R_DCK2
R_DCK4
G_DCK2
G_DCK4
B_DCK2
B_DCK4
LCDB1[11:0]
LCDB2[11:0]
CLK_B
SCL_7009i
SDA_7009i
SCL_7009
SDA_7009
R LCD Driver
G LCD Driver
B LCD Driver
RSIG[12:1]
RVCOM
RPSIG
GSIG[12:1]
GVCOM
GPSIG
BSIG[12:1]
BVCOM
BPSIG
R_DCK1
R_DCK2
R_DCK3
R_DCK4
HCK1_R
HCK2_R
G_DCK1
G_DCK2
G_DCK3
G_DCK4
HCK1_G
HCK2_G
B_DCK1
B_DCK2
B_DCK3
B_DCK4
HCK1_B
HCK2_B
R LCD
G LCD
B LCD
Audio
AUDIO
Audio out
AUDIO_O+
AUDIO_O
AUDIO_O-
Speaker
Audio Input/Output & volume control
AUDIO_PWR
AUDIO_SW
AUDIO_MUT
AUDIO_VOL1
AUDIO_VOL2
RS-232 Remote Control
TX.DL
RX.DL
RS232 Driver Receiver
TXD
RXD
Fan 1
Fan 2
Fan 3
Fan 4
Fan 5
Fan1
FG1
Fan2
FG2
FG3
Fan4
FG4
Fan5
FG5
Fan Control
FAN_SW
SDA
SCL
U33
EEPROM
AT24C32CN
Keystone Sensor
32.768 KHz
Thermal Sensor 2
D[0:15]
A[0:21]
ROMWEn
ROMOEn
Flash memory
Reset IC
LED[4:1]
LED Driver
Keypad Input
PWR_fail
Power Fail DET
P15VP
P12V
P5V
POWER_ON
PVCC_POWER_ON
Power Control
P15V
P5VC
P15VP
P5V
Dust_SW
Door_SW
Dust SW Door SW
Lamp_PWR
TXD
RXD
Ballast
Power Switch
Lamp_EN
DVS
Lamp_SyncEN
Lamp Control
VST
3.3V
+3.3V REG
P5VC
2.5V
+2.5V REG
1.8V
+1.8V REG
P1P8V
P2P5V
P3P3V
P33V

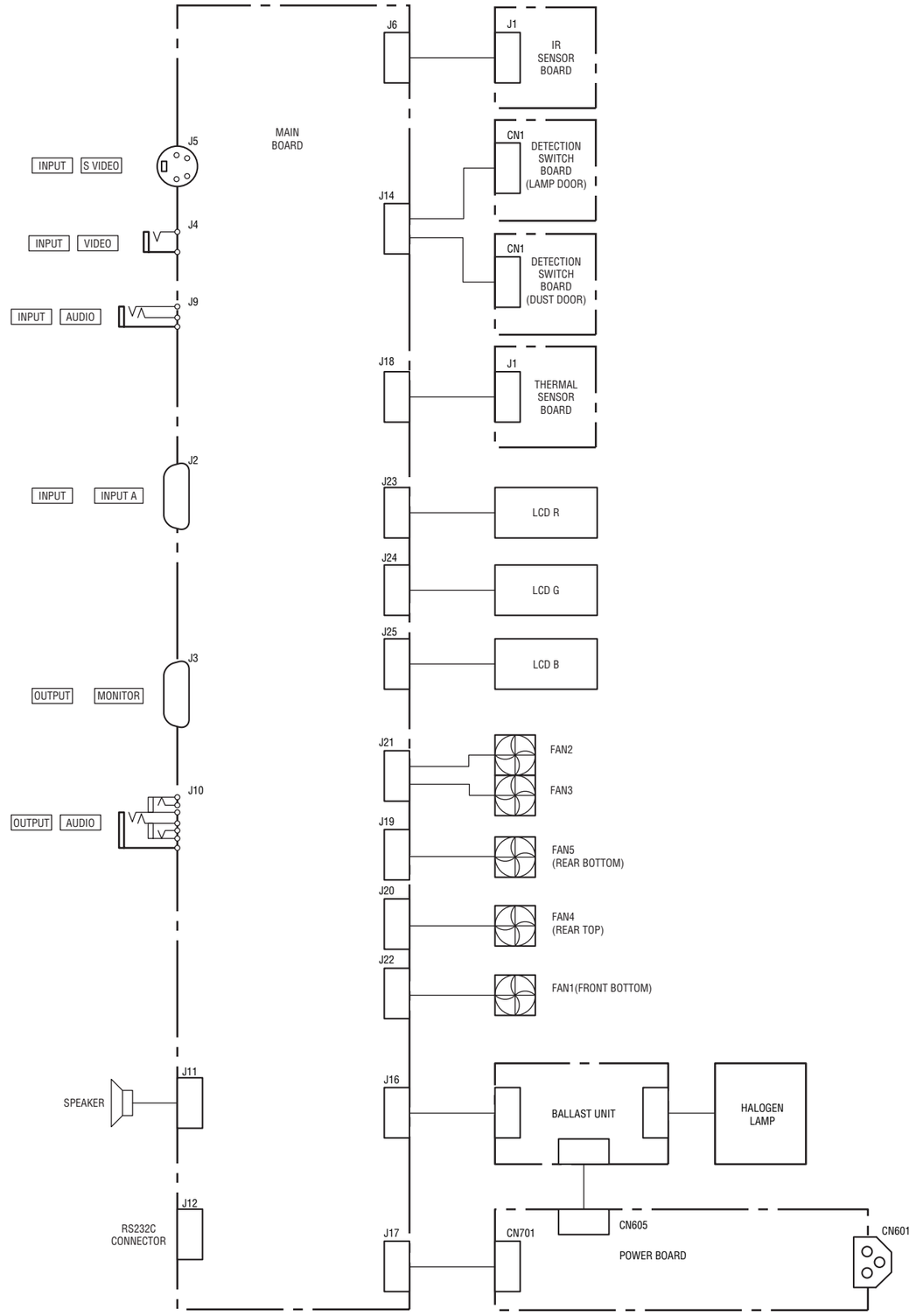
VPL-EX7


IR Receiver
IRR5
IRR
S-Video
LUMA
CHROMA
Video
CVBS
INPUT A
PC-RIN2
PC-GIN2
PC-BIN2
HSYNC2
VSYNC2
Analog RGB Input/Output
PC-RIN
PC-GIN
PC-BIN
HSYNC
VSYNC
Monitor Output
R_OUT
G_OUT
B_OUT
HSYNCO
VSYNCO
Audio Input
AUDIO_M
Audio Input/Output & volume control
AUDIO_PWR
AUDIO_SW
AUDIO_MUT
AUDIO_VOL1
AUDIO_VOL2
Audio out
AUDIO_O+
AUDIO_O
AUDIO_O-
Speaker
RS-232 Remote Control
TX.DL
RX.DL
RS232 Driver Receiver
TXD
RXD
Fan 1
Fan 2
Fan 3
Fan 4
Fan 5
Fan1
FG1
Fan2
FG2
FG3
Fan4
FG4
Fan5
FG5
Fan Control
FAN_SW
SDA
SCL
U33
EEPROM
AT24C32CN
32.768 KHz
Thermal Sensor 2
Video Processor & Controller
U20
EEPROM
AT24C256N
SCL_DSD
SDA_DSD
DR[9:0]
DG[9:0]
DB[9:0]
PG_XCLR_OUT
PG_PLLSTB_OUT
DCLK
DHS
DVS
27 MHz
D[0:15]
A[0:21]
ROMWEn
ROMOEn
Flash memory
Reset IC
LCD Timing Generator
LCDR1[11:0]
LCDR2[11:0]
CLK_R
PRG
FRP
VD
LCDSCAN
LCDXSCAN
LCDENB
LCDHST
LCDVST
LCDVCK
LCDPCG
LCDDWN
HCK
HCK
HCK
HCKx
HCKx
HCKx
SCAN
XSCAN
ENB
HST
VST
VCK
PCG
DWN
HCK1_R
HCK1_G
HCK1_B
HCK2_R
HCK2_G
HCK2_B
R LCD Driver
SCL_7009
SDA_7009
RSIG[12:1]
RVCOM
RPSIG
R_DCK1
R_DCK2
R_DCK3
R_DCK4
HCK1_R
HCK2_R
R LCD
LCDG1[11:0]
LCDG2[11:0]
CLK_G
DCK[4:1]_R(G,B)
R_DCK1
R_DCK3
G_DCK1
G_DCK3
B_DCK1
B_DCK3
R_DCK2
R_DCK4
G_DCK2
G_DCK4
B_DCK2
B_DCK4
G LCD Driver
GSIG[12:1]
GVCOM
GPSIG
G_DCK1
G_DCK2
G_DCK3
G_DCK4
HCK1_G
HCK2_G
G LCD
LCDB1[11:0]
LCDB2[11:0]
CLK_B
B LCD Driver
BSIG[12:1]
BVCOM
BPSIG
B_DCK1
B_DCK2
B_DCK3
B_DCK4
HCK1_B
HCK2_B
B LCD
SCL_7009i
SDA_7009i
LED[4:1]
LED Driver
Keypad Input
PWR_fail
Power Fail DET
P15VP
P12V
P5V
POWER_ON
PVCC_POWER_ON
Power Control
P15V
P5VC
P15VP
P5V
Dust_SW
Door_SW
Dust SW Door SW
Lamp_PWR
TXD
RXD
Ballast
Power Switch
Lamp_EN
DVS
Lamp_SyncEN
Lamp Control
VST
3.3V
+3.3V REG
P5VC
2.5V
+2.5V REG
1.8V
+1.8V REG
P1P8V
P2P5V
+2.5V REG
P3P3V
+3.3V REG
P33V
+3.3V REG

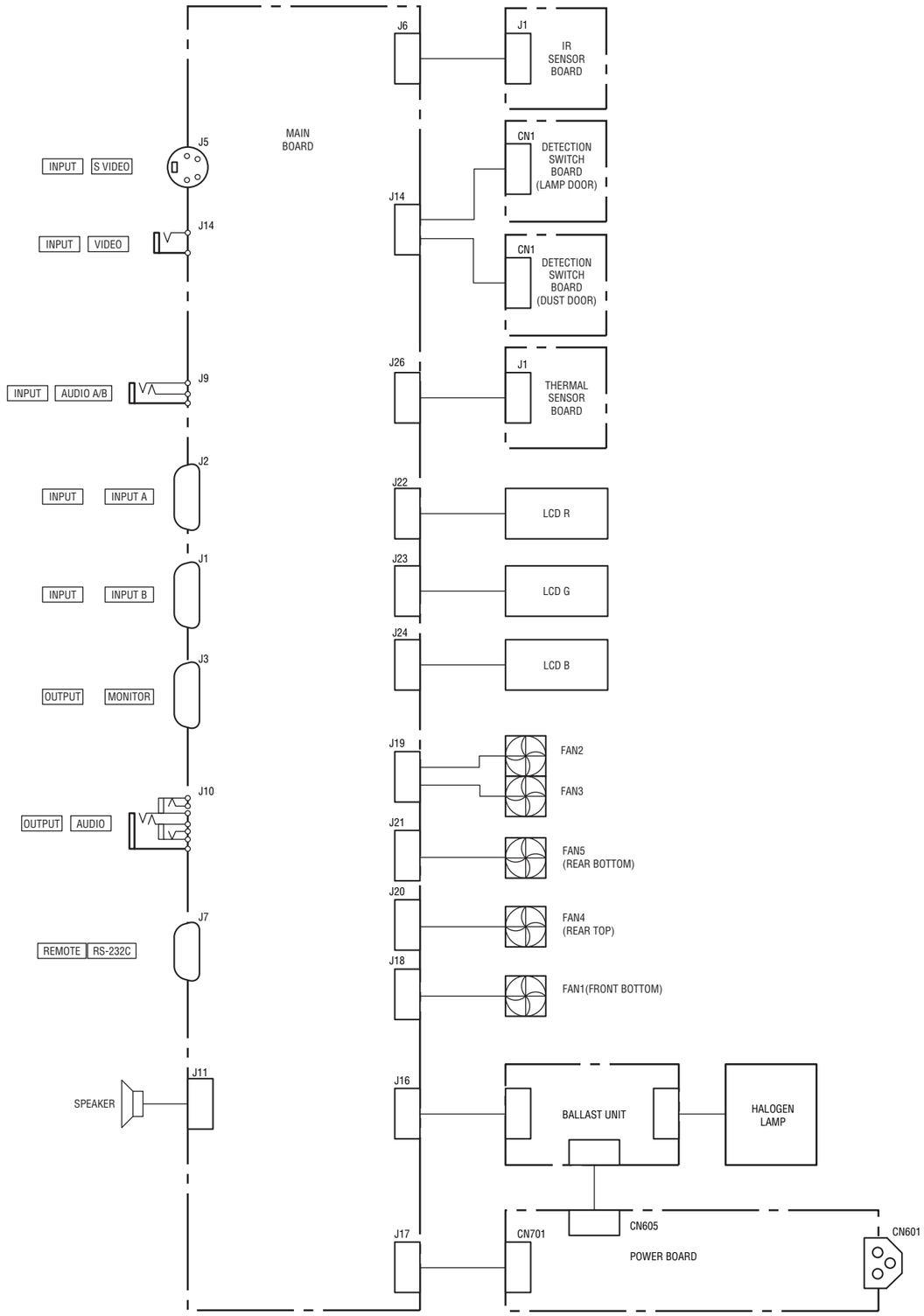
Section 6
Diagrams

6-1. Frame Schematic Diagrams

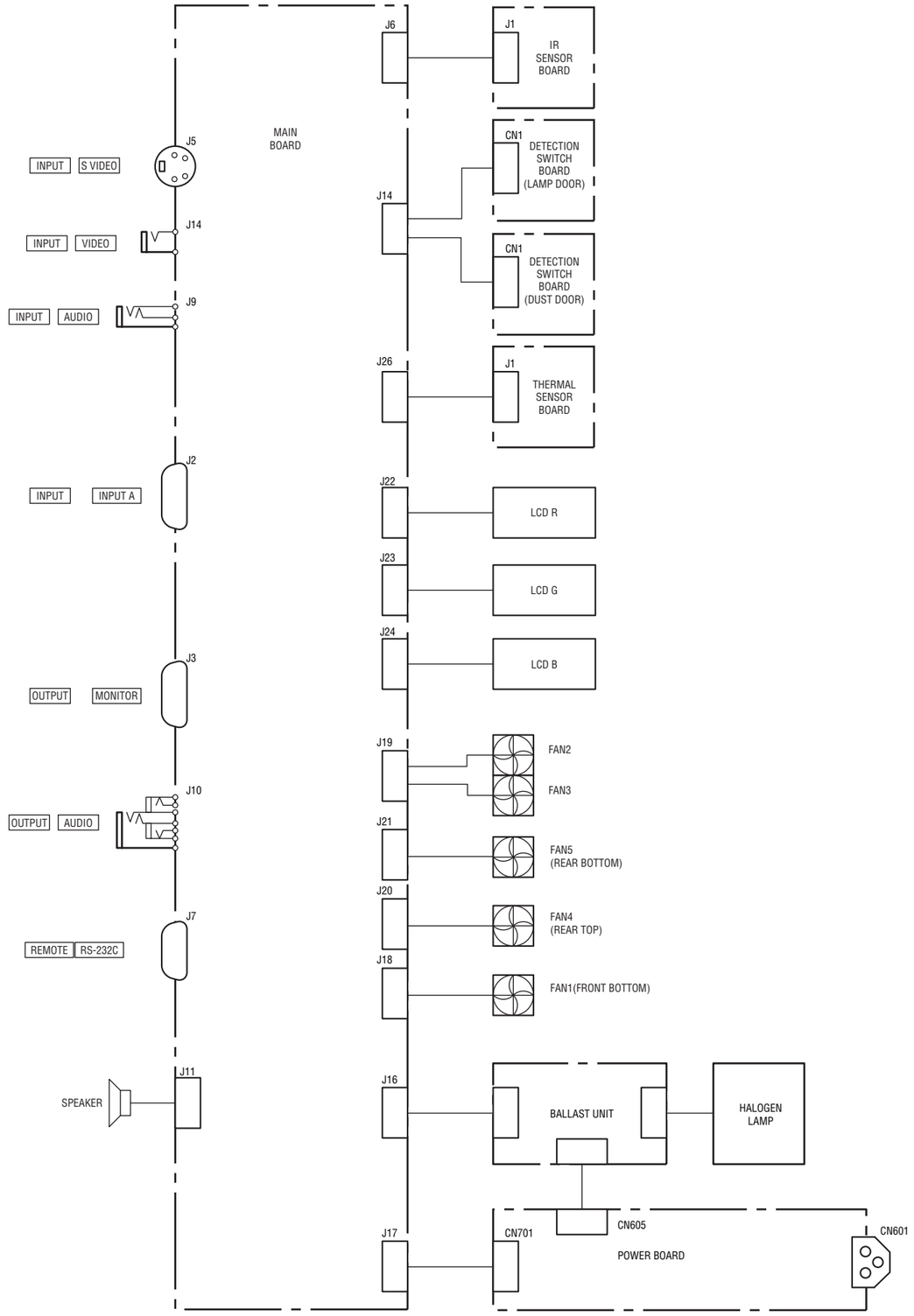
VPL-ES7



VPL-EX70


MAIN BOARD
J5
INPUT
S VIDEO
J14
INPUT
VIDEO
J9
INPUT
AUDIO A/B
J2
INPUT
INPUT A
J1
INPUT
INPUT B
J3
OUTPUT
MONITOR
J10
OUTPUT
AUDIO
J7
REMOTE
RS-232C
J11
SPEAKER
J6
J1
IR SENSOR BOARD
J14
CN1
DETECTION SWITCH BOARD (LAMP DOOR)
CN1
DETECTION SWITCH BOARD (DUST DOOR)
J26
J1
THERMAL SENSOR BOARD
J22
LCD R
J23
LCD G
J24
LCD B
J19
FAN2
FAN3
J21
FAN5 (REAR BOTTOM)
J20
FAN4 (REAR TOP)
J18
FAN1(FRONT BOTTOM)
J16
BALLAST UNIT
HALOGEN LAMP
J17
CN701
CN605
POWER BOARD
CN601

VPL-EX7


MAIN BOARD
J5
INPUT
S VIDEO
J14
INPUT
VIDEO
J9
INPUT
AUDIO
J2
INPUT
INPUT A
J3
OUTPUT
MONITOR
J10
OUTPUT
AUDIO
J7
REMOTE
RS-232C
J11
SPEAKER
J6
J1
IR SENSOR BOARD
J14
CN1
DETECTION SWITCH BOARD (LAMP DOOR)
CN1
DETECTION SWITCH BOARD (DUST DOOR)
J26
J1
THERMAL SENSOR BOARD
J22
LCD R
J23
LCD G
J24
LCD B
J19
FAN2
FAN3
J21
FAN5 (REAR BOTTOM)
J20
FAN4 (REAR TOP)
J18
FAN1(FRONT BOTTOM)
J16
BALLAST UNIT
HALOGEN LAMP
J17
CN701
CN605
CN601
POWER BOARD

VPL-ES7 (SY)
VPL-ES7 (CH)
VPL-EX7 (SY)
VPL-EX70 (SY)
VPL-EX70 (CH) E
9-883-673-01

Sony EMCS Corporation
Ichinomiya Tec

English
2009CR16-1
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